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E. B. FOOTE M.D.

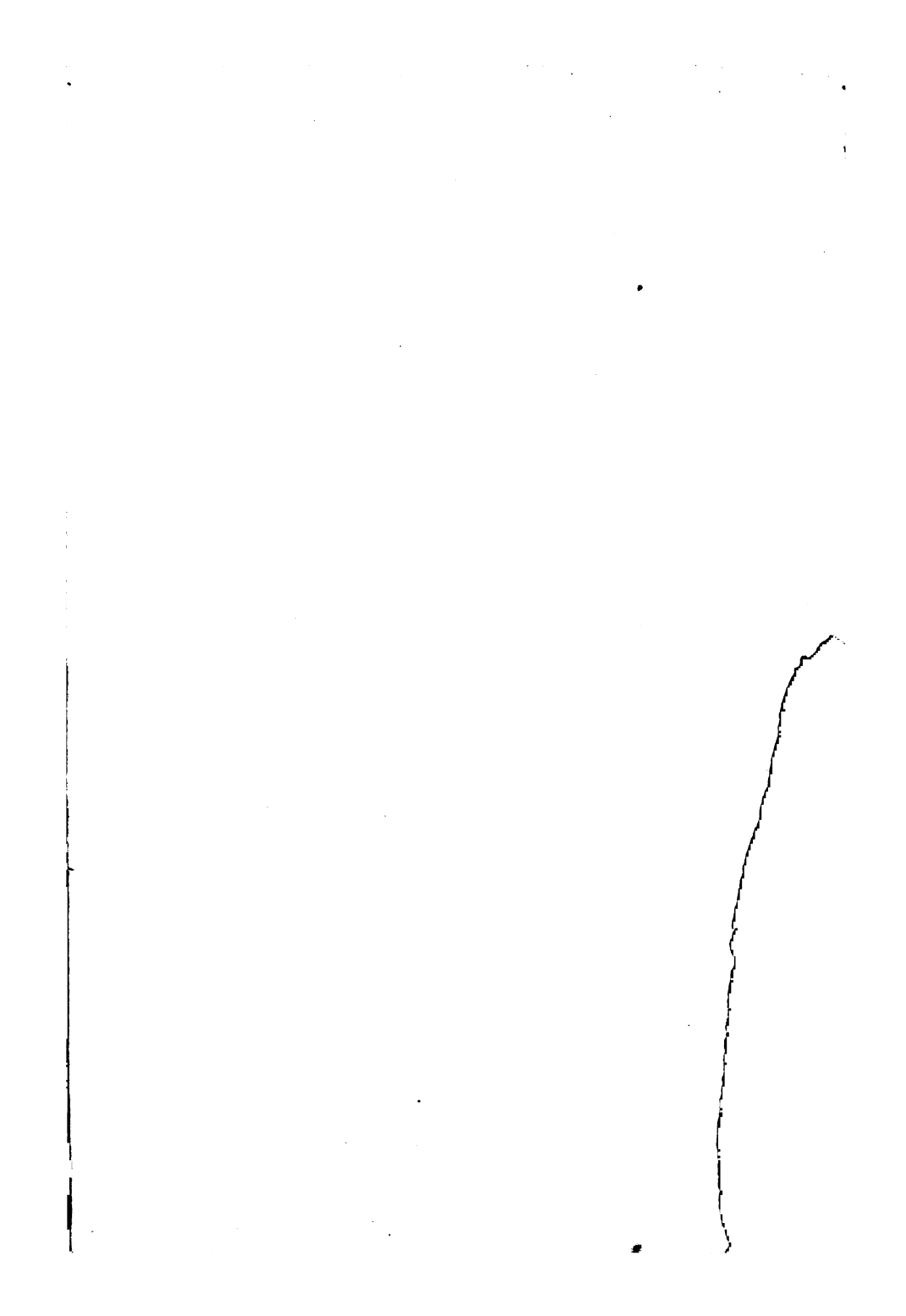


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**AUTHOR OF MEDICAL COMMON SENSE, PLAIN HOME TALK, SCIENCE IN STORY
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HISTORY OF DR. FOOTE'S BOOKS.

Publisher's Preface and Announcement.

MEDICAL COMMON SENSE was Dr. Foote's first great hit in the literary line. It was his first venture in book writing, and though published during the business depression of 1857-58, there were over a quarter of a million copies sold. About 1869 the author revised his work and enlarged it to three times its first size, and brought it out under the title **PLAIN HOME TALK**, embracing **MEDICAL COMMON SENSE**. This, too, took the popular eye at once, and sold at the rate of about twenty thousand copies a year for thirty years, over half a million in all. It was kept "up-to-date" by more or less revision of every new edition, and came to be regarded as a household necessity, as thousands, who somehow lost their books, said when ordering a second or third copy. It is a fair estimate that during thirty years one hundred thousand flattering testimonial letters were received by the author—at least ten coming in every day's mail. In order to keep it fully up to the times, and even a little in advance of "the car of progress," he partially retired from professional work in 1899 and 1900 and devoted his whole time to careful revision and "expansion" of this great work. It was entirely rewritten, reset in new type, increased in size by five hundred pages, indexed, largely re-illustrated, and improved by doubling the number of chromo plates, and is now offered as the earliest, freshest, most recent and complete popular medical book for the **TWENTIETH CENTURY** in the following editions, forms or styles:

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It will be understood from the above that Dr. Foote's latest writings can be had in one complete volume or in two companion books, and anyone obtaining one of the latter will please remember, in tracing references from one page to another, that Parts I. and II. are in "The Medical" volume and Parts III. and IV. in "The Social" volume.

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PREFACE.

For the fourth time I make my bow to a generous public. For the fourth time I serve to my patrons a dish of what I term medical common sense. The book entitled "Medical Common Sense" had its birth in 1858. It was a volume of about 300 pages and less than one hundred illustrations. When it first made its appearance some of my prudent friends shook their grave heads, and predicted for the author pecuniary failure and professional disgrace. Like those of many other prophets, their predictions proved to be only croakings, and the expected martyr soon found himself surrounded by hosts of new friends and swarms of new patients. While awaiting the popular verdict, after the first issue, one of the oldest and most noted clergymen of New York called at my office for the express purpose of assuring me how much he was pleased with the publication, and his appreciation possessed greater value to me because he had studied medicine in his youthful days, with the view of fitting himself for practice. He pronounced "Medical Common Sense" a refreshing contribution to medical literature, and expressed a hope that it would obtain a large circulation. I breathed easier, for the splendid physique, generous countenance, cultivated manner and commanding presence of the first juror gave to his encouraging words the color and impressiveness of authority, and I almost felt as if the popular verdict had already been rendered.

It is many years since this noted man passed to the "great beyond," at the ripe age of eighty-six. The New York *Evangelist*, in its obituary notice, said: "So ends a long and distinguished public career. So passes away one of the great men of a former generation. His name has been a household word for half a century. In the Presbyterian Church he stood in the very front rank. * * * By his great power he made his influence felt in every sphere in which he moved. * * * His commanding presence, ready tact, and powerful utterance combined to make him in deliberative and popular assemblies a leader of men." These brief quotations are made to show what manner of man this clergyman was who endorsed a popular medical work which broke away from orthodoxy in medicine and opened up new paths for those who were groping in the wilderness of doubt and uncertainty, vainly looking for hope and relief from chronic physical ills. The youthful author was barely twenty-nine years of age; the clergyman in the "glory of his ripe manhood." It can be well imagined that any misgivings as to how the volume would be received gave way to confident expectation; nor was this feeling delusive, for, as the book continued to circulate, letters came in daily, like the drop-plugs of the ballots on election-day, from intelligent men and women in all parts of the country, thanking me for the information I had presented in language which could be comprehended by the masses of the people. The appreciation of the latter was attested by the fact that between 1858 and 1869 over two hundred and fifty thousand copies were sold, a circulation which I venture to affirm had been attained by no other medical work of like size at that time in the same limited period in this or any other country. Perhaps one of the most striking evidences of its popularity is the fact that two or three other medical book-makers imitated this taking title with just sufficient variation to evade the statutes protecting original authors.

My correspondence with the people often exceeded one hundred letters per day, and the personal experiences and observations confided to the author enabled me to form some conception of the popular needs, and to supply still further that physiological instruction so greatly demanded to make mankind healthy and happy. Hence my second revision, made in 1870, with the title of "PLAIN HOME TALK, EMBRACING MEDICAL COMMON SENSE," a book containing nearly 1,000 pages, and over 300 illustrations. In this revision it was my aim to answer, as nearly as possible, all the questions that had been put to me in the intervening years, and to recommend such measures for individual and social reform as I thought would prove morally and physically beneficial. To fulfil my duties in these respects, I could not make a volume suited for the centre-table, nor yet a work that should find place on some obscure shelf. The medicine closet or family library seemed to me to be an appropriate place for the book. Time proved that this venture was not without success. Mrs. Elizabeth Thompson, the noted philanthropist and reformer of that time, called upon the author to express her pleasure on reading the work, and purchased fifty copies to give to her friends. Meeting the well-known veteran litterateur and traveller, the late Stephen Massett, at a banquet in New York, he remarked: "I have met your remarkable work in every clime I have visited—even in far-off South Africa." Fully half a million copies have been sold, and still it meets with public appreciation, as is evidenced by the fact that the publishers print an edition of about fifteen or twenty thousand every year. It has been translated into the German language, and has found thousands of readers in the German Empire. The title of the German edition is "Offene Volks Sprache."

After the lapse of more than a quarter of a century, with a third and fourth revision, this new book, printed on fresh electrotype plates, appears with three hundred and thirty-one illustrations, many of them entirely new, eight additional colored plates, a *copious Index*, and not less than five hundred pages of new matter, which could not have found place in this already bulky volume, had it not been put in smaller type. It is a remarkable fact that "Plain Home Talk" was so far in advance of the times when published (some said fifty years) that it is not now necessary to "write it up to date." It has been like a perpetual almanac from the moment it was first issued. A correspondent, a well-known horticulturist of Michigan, recently wrote: "Is Dr. Foote, the one who wrote 'Plain Home Talk,' still living? Does he know that many of his notions and sociological deductions have become popularized since 1857—since 1870?" Little that is new can be added; but many of the reforms advocated in the volume have been accomplished, and the essays devoted to them can be made conformable to the changes which have taken place. It can be freshened up a little with new dates and with observations on some of the remarkable advances in the domain of hygiene and medicine. A step still in advance of the times can be taken here and there, and it has been taken, as the reader will see.

There are portions of the Preface appearing in my first volume which I will reproduce here with some slight alterations and additions. "Common sense," I said, nearly forty years ago, is quoted at a discount, especially by the medical profession, which proverbially ignores everything that has not the mixed odor of incomprehensibility and antiquity. Medical works are generally a heterogeneous compound of vague ideas and jaw-breaking words, in which the *dead* languages are largely employed to treat of *living* subjects. Orthodoxy in medicine consists in walking in the beaten paths of *Esculapian* ancestors, and looking with grave contempt on all who essay to cut out new paths for themselves. Progress is supposed to be possible in everything except medicine; but in this science, which all admit has room for improvement, the epithet of "Quack" is applied to every medical discoverer. I trust I may prove worthy of the denunciations of the bigoted. This work is written for the amelioration of human suffering, and not for personal popu-

PREFACE.

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larity. To uproot error and do good should be the first and paramount aspiration of every intelligent being. He who labors to promote the physical perfection of his race; he who strives to make mankind intelligent, healthful, and happy, cannot fail to have reflected on his own soul the benign smiles of those whom he has been the instrument of benefiting.

My object in preparing this work is to supply a desideratum which has long existed, i.e., a medical work, reviewing *first causes* as well as facts and ultimate effects, written in language strictly mundane, and comprehensible alike to the lowly inmate of a basement and the exquisite student of an attic studio; and if successful in fulfilling the promise of the title-page, I have too much confidence in the intelligence of the masses and the erudition of the unprejudiced scholar to believe that it will be received with unappreciation or indifference. Many of the theories which these pages will advance are certainly new and antagonistic to those popularly entertained, but it does not follow that they are incorrect or unworthy the consideration of the philosophical and physiological inquirer. They are founded upon careful observation, experiment, and extensive medical practice, and if the truth of the theories may be judged by the success of the latter, then do they unmistakably possess soundness as well as originality, for living monuments to the skill and success of the author have been and are being daily raised from beds of sickness and debility in every part of the world. If these remarks sound boastful, be not less ready to pardon the conceit of a successful physician than that of a victorious soldier. The successful military chieftain is notoriously conceited; is it not as honorable and elevating to save life as to destroy it? If a man may boast that he has slain hundreds, cannot his egotism be indulged if he has saved the lives of thousands? I shall claim the soldier's prerogative, for when medical charlatans of every street-corner are blowing their trumpets, it does not behoove the successful physician to nurse his modesty. What I write, however, shall be written in candor, and with an honest intention of enlightening and benefiting humanity.

How far the heads of families may be willing to allow it to circulate among the younger members, it must be left for them to determine; but, if intelligent parents had had my experience they would place this book in the hands of all children who are capable of being interested in it. In other words, they would take no pains to conceal it from children of any age, because only those who understand it will become interested, and all possessing this degree of comprehension are liable to obtain erroneous and injurious information upon the same topics through impure and corrupting channels, though much care be exercised to prevent it. This is a fact which a large correspondence with young people has impressed upon the mind of the author, and would command the earnest attention of all parents and guardians, if they possessed the means of knowing what the writer does. I have received enough lamentations from the young of both sexes, resulting from their indiscretions, to fill these pages, and many of their letters do not hesitate to charge their parents with cruel neglect in keeping from them a knowledge of such vital importance. If this work is adjudged unsuitable, may be other works can be found that will answer the purpose, although I doubt if there is another book wherein the relations of all the organs of the system to each other, and those of the moral nature to the physical body, are more faithfully traced. For the adult this work contains information which no man or woman can afford to do without, when it may be obtained at a price so comparatively trifling. If the physiological deductions and social views of the author be not accepted the valuable facts upon which they are based remain, and the reader is at liberty to use them to sustain opinions and suggestions which he may adjudge more acceptable to the popular mind. Anything, everything—that the human family may grow wiser and happier.

E. B. F.

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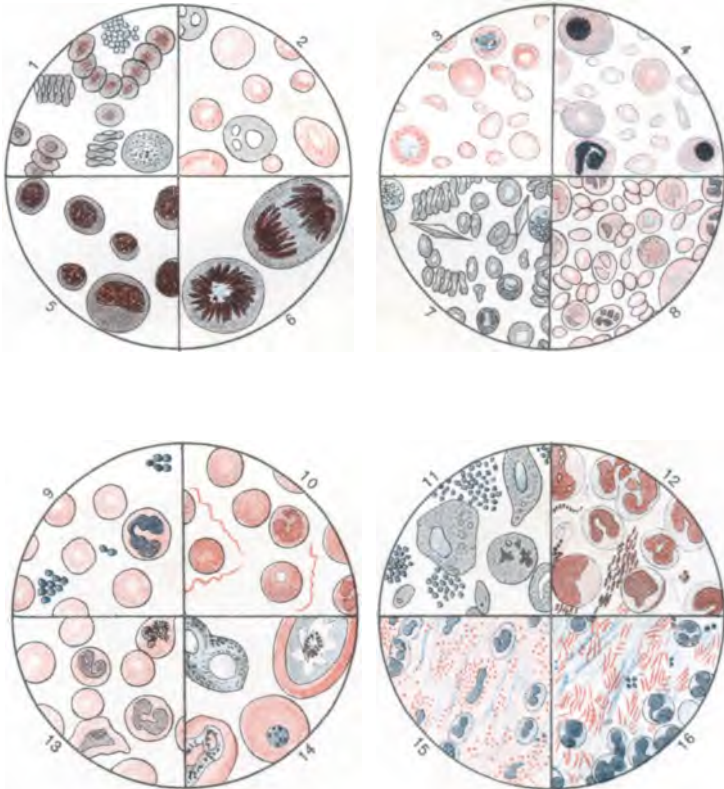
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PLATE I.

P. H. T. PART I. CHAP. I.

BLOOD DISEASES.



MICROSCOPE VIEWS OF BLOOD AND SPUTUM, ENLARGED 350 TO 1,500 TIMES ; MOSTLY STAINED BY CHEMICAL DYES NECESSARY TO BRING OUT DIAGNOSTIC POINTS.

- | | |
|--------------------------------|-------------------------------------|
| 1. NORMAL BLOOD CORPUSCLES. | 9, 10. PYAEMIA AND RELAPSING FEVER. |
| 2. ABNORMAL, IN ANAEMIA. | 11. NASAL CATARRH MUCUS. |
| 3, 4. IN "PERNICIOUS ANAEMIA." | 12. DIPHTHERIA MICROBES. |
| 5. WHITE CORPUSCLES, STAINED. | 13, 14. BLOOD IN MALARIA. |
| 6, 7, 8. " " IN LEUKEMIA, | 15. SPUTUM OF ASTHMA. |
| "THE WHITE-BLOOD DISEASE." | 16. SPUTUM OF PHTHISIS. |

PLATE II.

NERVOUS SYSTEM.

PLAIN HOME TALK.



BY PERMISSION OF THE CHART OF LIFE CO.

BACK AND SIDE VIEW OF CENTRAL NERVOUS SYSTEM, THE BRAIN AND SPINAL CORD, SHOWING ALSO THE GANGLIONIC OR SYMPATHETIC NERVOUS SYSTEM, AND THE LOCATION OF THE VITAL ORGANS.

THE SMALL FIGURE, AT THE RIGHT, IS A MICROSCOPIC VIEW OF A NERVE CELL AND PROCESS (A NEURON), AND FIBRE WITH ITS SHEATH.

PART I.

Disease: Its Causes, Prevention, and Cure.

OPENING CHAPTER.

DISEASE AND ITS CAUSES.



OUR planet with each revolution carries a huge load of human suffering, a large portion of which arises from disease. We see this enemy in the cradle, distorting the features and bedimming the eyes of innocent babes. Too often it carries its little victims to the burial-ground, bathed with the tears of mothers. We see it in youth-

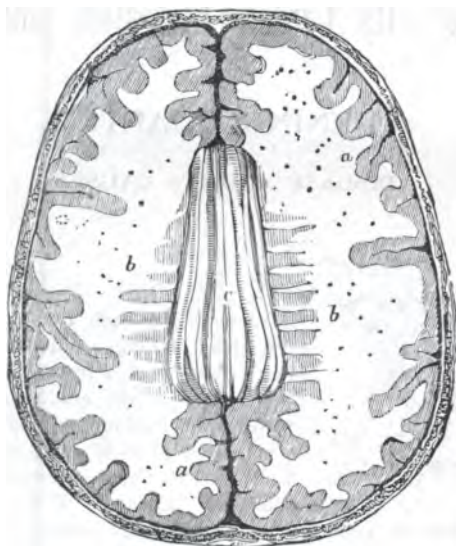
hood, arresting the physical development of young men and young women; consigning them to premature graves, or moving them like sickly shadows through years of hapless life. It rudely grasps people in the prime of life, and hurries them away from fields of useful labor to wearisome chambers, where the mind, which has been schooled to

activity, becomes a dangerous ally to the enemy by chafing and fretting in its imprisonment. It lays violent hands on our gray-haired fathers and mothers, who yesterday greeted us with the smile, animation, and elasticity of youth, but who to-day go groping about with rounded shoulders and trembling steps. At last, it arrests the physical functions, the outer shell returns to its original dust, and the inner, living body, enters the new life, where—may we hope—this fearful disturber of our comfort and happiness is refused admission.

The Causes of Disease.

Disease of every character, except that which may be induced by poison or by accident to body or limb, originates in a derangement of the circulation of vital electricity, disturbance of the mind, or an abnormal condition of the blood. Wherever it begins, unless speedily checked, the whole system is soon convulsed in its grasp, because of the close relationship existing between the various organs of the body. Those who have neglected the study of Physiology, as well as all who

FIG. 1.



CAPITOL OF THE NERVOUS SYSTEM.

The above represents a horizontal section of the brain and bones of the skull ;
a a, outer layer of ash-colored matter ; *b b*, the white or internal
 substance of the brain ; *c*, the corpus callosum.

have merely scanned the pages of ancient and modern superficial writings, will not readily comprehend the truth of these propositions. The most illiterate men of the civilized world are aware that they have a brain (however barren of idea), and that their bodies have nerves, arteries, and veins. But few physicians, especially of the old prejudiced school, know the real offices of them. Doctors who have brandished scalpels in the dissecting-room can point out the exact locality of every nerve, vein, muscle, tendon, etc., but the means by which each per-

forms its appropriate part, seldom awakens curiosity. Turn to a medical dictionary for a definition of the brain; the learned physiological lexicographer says: "The use of the brain is to give off nine pairs of nerves and the spinal marrow, from which thirty-one pairs more proceed, through whose means the various senses are performed, and muscular motion excited." This is all very well so far as it goes, but it will not satisfy the mind of a thorough inquirer, nor illustrate the truthfulness of my first remark. The sublime powers and superior beauties of the brain are undiscovered in such a superficial definition. The object of this chapter requires a better one. Let us have a *name* for the brain which will convey a better understanding of its office. I propose to call it the **CAPITOL OF THE NERVOUS SYSTEM**. It stands in the same relation to the human body that the Capitol at Washington does to the United States. There are telegraphic wires proceeding from this Capitol which connect with other wires leading to every part of the Republic, and there are nerves proceeding from the brain which connect with other nerves leading to every part of the human system. These nerves are like telegraphic wires, and convey impressions to and from the brain with the velocity of lightning. They permeate the skin so extensively that a slight change in the atmosphere is quickly telegraphed to the physiological capitol. Experiment has demonstrated the fact, that the intelligence of an impression made upon the ends of the nerves in communication with the skin, is transmitted to the brain with a velocity of about one hundred and ninety-five feet per second. Intelligence from the great toe is received through the nervous telegraph at the physiological capitol, called the brain, in only about one-thirtieth of a second later than from the ear or face.

The digestion of food, by which process blood is manufactured, depends upon the electric currents sent by the brain through the pneumo-gastric telegraph, or nerve, to the stomach. The correctness of this hypothesis has been illustrated by experiments tried by a celebrated physician in England. In these, a couple of rabbits were selected, which had been fed with the same kind and quality of food. On one of them he performed the operation of cutting the pneumo-gastric nerve leading to the stomach. The latter being deprived of the nervous stimulant, the animal soon died from the effects of a loaded stomach coupled with suspended digestion. The other rabbit, which was not operated on, was killed after an interval of almost twenty-six hours, and on examination it was proved that the food in its stomach was entirely digested, while in that of the former, the food remained almost as crude and undigested as when it left the masticating organs. Another experiment was made upon two more rabbits in the same manner, except that after the nerves leading to the stomach were cut, galvanism was applied in such a way as to send the current through the discon-

nected nerves to the seat of digestion. At the end of twenty-four hours they were both killed, when it was found that the food in the stomach of the one whose nerves had been severed, and put in connection with the galvanic battery, was nearly as well digested as that in the other, which had not been operated on. These experiments show that the stomach depends for the performance of its office on the electrical or nervous stimulus which it receives from the brain. Similar experiments to those just mentioned have been tried with reference to the heart and other organs, in all of which they ceased to perform their functions when the nerves were cut, and commenced again as soon as the galvanic fluid was applied. It is not necessary for the purposes of this treatise, to demonstrate that galvanism and this nervous element provided by the brain are identical. It is evident that they are not; but they are so closely related that one will perform the office of the other, and this fact is sufficient to show that the two forces or elements are similar in their character, and that one is a modified form of the other. Animal magnetism, electro-magnetism, galvanism and electricity, all differ a little from each other, and in employing the term *electricity*, chiefly in speaking of the nervous forces, I do so because it is a term better understood by the masses.

NERVOUS TELEGRAPHY.

I have said that the brain is the capitol of the nervous system. It may also be called the great receiving and distributing reservoir of nervo-electricity. It is largely composed of two substances: one an ash-colored matter, which, if spread out, would cover a surface of six hundred and seventy square inches; the other, a fibrous matter, firm in texture, and tubular. The ash-colored matter is the receiving, and the fibrous matter the distributing reservoir. There are in other parts of the system various smaller receiving and distributing reservoirs, composed of the same substances, but all these are under the control of the superior one located in the brain. These are called by physiologists nerve-centres, and to carry out the analogy between our nervous system, and the telegraphic system of our country, the nerve-centres may be compared to our State capitols.

The spinal cord is the great nervous trunk, or the main telegraphic wire leading from the brain, and from the brain and spinal cord proceed the motor nerves, the nerves of sensation, and the nerves of special sense. With the motor nerves the mind telegraphs to the limbs to move, and they instantly obey, for the force they carry contracts one set of muscles and expands another; for electricity, whether animal or mechanical, has the power to contract or expand any substance. By the action of the motor nerves upon the muscular system, the phenomena of animal motion are performed. Through the nerves of sensation the

brain is quickly informed by the telegraph, if a wound is being inflicted upon any portion of the body, if disease is intruding itself upon any organ, or if anything disagreeable or pleasurable is brought in contact with any part of the body. Through the nerves of special sense, the brain is informed by telegraph whether it be light, or dark—whether there be silence, or noise, etc. So we see that the Great Artificer, and not Professor Morse, was the inventor of telegraphy. To Morse belongs the honor, and it is indeed a great one, of having adapted this same system of intercommunication with the quickness of lightning between villages, States, and nations; a discovery which will eventually unite all mankind in common sympathy and brotherhood.

Most people know that telegraphic operators supply the electricity which they send over the wires by galvanic batteries, prepared according to the usual processes explained in our school-books of Philosophy. But whence is this animo-vital electricity we have been speaking of derived? Well, I will tell you. The principal source is the stomach, that ever-active laboratory. The dissolution of any substance sets free the element commonly called electricity. The food you eat, if digestible, goes through a process of dissolution in your stomach, and as it dissolves, the electricity evolved ascends through the nerves made for the purpose, to the ash-colored matter of the brain. The vitalizing property of air is mainly electricity, and, consequently, we receive this element by the lungs and pores, from which it is taken up by the blood, and carried to the great receiving reservoir of the brain, which, I may add, accommodates more blood than the fibrous matter of the brain. The blood on entering the ash-colored matter discharges its cargo of electricity and nerve-nutrient, and returns to the body for another load.

Large quantities of animal electricity are also generated by the alkalies and acids of the animal organism. The mucous membranes, or linings of the cavities, are continually excreting a semi-fluid called alkali, and the serous membranes, or outer coverings of the same, an aqueous or watery fluid, called acid, and according to the testimony of Dr. Bird, if these fluids are so placed as to be connected by parietes of an animal membrane, or a porous diaphragm, a current of electricity is evolved.

Hence, we find that not only are our stomachs generating electricity, but we are inhaling it by our lungs, and our pores, and the external or serous, and internal or mucous surfaces, united as they are by natural parietes and porous diaphragms, are producing it in large quantities. As it is produced, or enters the system, it is so modified as to be made fit for the uses of the body.

The brain is as industriously distributing this vital electricity through the system, as the heart is circulating the blood, and too much, or too little, given to any particular organ, produces disease therein.

The complete withdrawal of *nervo-electricity* from any part paralyzes it, so that it has neither sense nor motion. If withdrawn from the motor nerves only, sensation remains, while motion is lost ; if from the nerves of sensation only, then motion continues, but sensation is destroyed.

FIG. 2.



PROFESSOR BRAIN'S TELEGRAPH.

If withdrawn from the nerves of special sense, the power of hearing, seeing, smelling, and tasting is lost ; or it may be withdrawn from only one set of the nerves of special sense, producing some of the foregoing difficulties, without affecting the other senses. Too little vital electricity given to the liver, renders that organ torpid—too much, causes nervous congestion and inflammation ; too little given to the stomach causes nervous *dyspepsia*—too much makes the appetite voracious, and induces other derangements to the digestive machinery ; and hence, we see that to all the organs a proper quantity must be distributed, or disease results.

It is unnecessary to pursue this explanation further to show that the nervous system is a complex piece of machinery, as delicate almost as the spider's web which is spread out over the meadow grasses, and that many diseases arise from a defective nervous system. Those which do not and which may not come under the exceptions mentioned at the opening of this work, can be

traced to disturbances of the mind, or to an abnormal condition of the blood.

MENTAL DISTURBANCES.

From what has already been said, it is apparent to any logical mind that diseases often result from trouble or depression of mind. So closely allied are the brain and the nervous or telegraphic system, it is impossible for one to be disturbed without exciting the sympathy of the

other. The brain, besides being the receiving and distributing reservoir of animal electricity, is the residence of the mind, or the Ego which controls its action. When, then, anything occurs to disturb the equanimity of the mind, the brain at once telegraphs the melancholy news over the wires, or nerves, to every organ of the body, and, like a well-regulated and affectionate family, all join in sympathy for the afflictions of the one which they regard as the head and provider. In some cases, when great grief or emotion is present, the brain works so actively in producing intense thought, that it consumes all, or nearly all the vital electricity of its reservoir, and when this bankruptcy takes place, it even withdraws that which it has supplied to the vital organs. When it reaches this crisis, death results. Emotions of the mind, it is well known, greatly affect the organic secretions, and Dr. Trall does not greatly magnify a fact, when he remarks "that they may be depraved or vitiated as readily by excessive mental emotion, as by a drug poison taken into the stomach." He continues by saying, that "a paroxysm of anger will render the bile as acrid and irritating as a full dose of calomel; excessive fear will relax the bowels equal to a strong infusion of tobacco; intense grief will arrest the secretions of the gastric juice as effectually as belladonna; and violent rage will make the saliva as poisonous as will a mercurial salivation."

Says Combe: "The influence of the brain on the digestive organs is so direct, that sickness and vomiting are among the earliest symptoms of many affections of the head, and of wounds and injuries to the brain, while violent emotions, intense grief, or sudden bad news, sometimes arrest at once the process of digestion, and produce squeamishness, or loathing of food, although an instant before the appetite was keen. The influence of the mind and brain over the action of the heart and lungs is familiar to every one. The sighing, palpitation, and fainting so often witnessed as consequences of emotions of the mind, are evidences which nobody can resist. Death itself is not a rare result of such excitement in delicately organized persons."

A story related by the late English author, Eliot Warburton, is interesting in this connection. "A Howadji, or sacred traveller (more given to lectures than to prayers), met the plague coming out of Cairo, and reproached that demon with his murderous work. 'Nay,' said the fiend, 'I have slain but a few; it is true that twenty thousand of the faithful have died, but only one-tenth of them fell by my hand—the rest were slain by my fellow-demon, FEAR.'"

In times of war, the influence of the mind on health has been many times strikingly exhibited. During the great Civil War between the North and South, all newspaper readers knew of the fatality attending the Federal "Army of the Potomac" in the Chickahominy swamps. Most people attributed the prevalence of sickness and death among the

soldiers, at that time and place, simply to the unwholesome air of the locality, but this was not all. It was a dark day in our country's history ; many of our bravest men felt disheartened ; and mental depression, if not despair, rendered our country's noble defenders susceptible

FIG. 3.



THE HEART AND ARTERIES THAT CARRY THE GOOD VITAL FLUID TO ALL PARTS OF THE BODY, AND VEINS THAT RETURN THE CURRENT TO THE HEART.

to malarious influences, and they became ready victims to the unwholesome vapors with which they were enveloped.

The frightful mortality attending the allied armies at the Crimea, was no doubt more attributable to bad management on the part of the commanding officers than to inclement weather. The soldiers, having lost confidence in their commanders, became depressed in spirit ; they were filled with fearful forebodings ; the buoyancy of their nervous systems was disturbed, and thereby digestion impaired. Through these discouragements they were made susceptible to disease, and would have been liable to its attacks, however favorable the climate ; while a slight unfavorable change in a foreign atmosphere, under such circumstances, would induce fatal results.

The English press attributed the sudden death of Lord Raglan to the censures heaped upon him at home. Many politicians in this country ascribe the illness which ended the career of one of America's greatest statesmen, to disappointment in not receiving the Presidential nomination from a convention of his party.

Thus we see the influence of the mind on the body is generally understood and admitted. But few stop to divine the means by which it is effected. It is well, therefore, to understand that every organ is notified on the telegraphic system, if any thing offends the seat of consciousness of the human being, and these organs are often taxed or compelled to give back part of the nervo-electricity with which they are performing their offices. If, through any accident to the limbs,

contact with any powerful poison, or impurity of the blood, the harmonious evolution and circulation of the nervo-electric fluid in any part of the body are disturbed, the brain feels the effect, discovers the cause, and faithfully informs all the members of the family, who contribute vital healing forces with which they endeavor to conciliate the difficulty, and if they fail, the whole system is thrown into discord.

BLOOD DERANGEMENTS.

Next, I will speak of the blood, for all diseases which do not arise from the causes already named and explained, have their birth in a deranged condition of that almost as mysterious fluid which circulates through the entire system. In plain language, the blood is fluid bone, fluid cartilage, fluid muscle, fluid nerve, and fluid everything that goes to make up the human body. Technically, it is mainly composed of corpuscles floating in *liquor sanguinis*. These corpuscles are minute bodies, resembling, very nearly, in shape, pieces of coin, as represented in the illustration, Fig. 9. They can only be seen by aid of the microscope. There are two kinds of corpuscles, the red and the white, or colorless. In health, the red predominates in the ratio of three or four hundred to one of the white corpuscles. Hoffman estimates that there are twenty-eight pounds of blood in a man of average size. This fluid is circulated through the system by the heart, arteries, capillaries, and veins. The heart may be

said to be the capitol of the vascular system, as the brain is the capitol of the nervous system. It may also be called the receiving and distributing reservoir of the blood, as the brain is the receiving and distributing reservoir of the nervo-electrical forces. The heart is an incess-

FIG. 4.



DIAGRAM OF BLOOD CIRCULATION.

1, 2, left heart ; 3, 4, right heart ; 5, 6, lungs ; 7, great arteries ; 8, brain ; 9, great veins ; 10, spleen ; 11, intestines ; 12, kidneys ; 13, lower extremities ; 14, liver.

sant worker and a good manager. It pumps vital or arterial blood through the arteries and capillaries to every part of the system, and pumps it back through the veins to itself again, and then pumps it into the lungs, to become revitalized by the oxygen of the air we breathe, from which it again receives it to send it on its recuperative mission. The heart undergoes four thousand contractions per hour; each ventricle is

FIG. 5.



CAPITOL OF THE VASCULAR SYSTEM.

1, The superior vena cava; 2, the inferior vena cava; 3, the right auricle; 4, the right ventricle; 5, the situation of the tricuspid valves; 6, the partition between the two ventricles; 7, the pulmonary artery; 8, the point where it separates and enters the right and left pulmonary artery for the corresponding lungs; 9, the four pulmonary veins bringing the blood into the left auricle; 10, the left auricle; 11, left ventricle; 12, location of mitral valve; 13, location of sigmoid valves of the aorta; 14, the position of the sigmoid valves of the pulmonary artery.

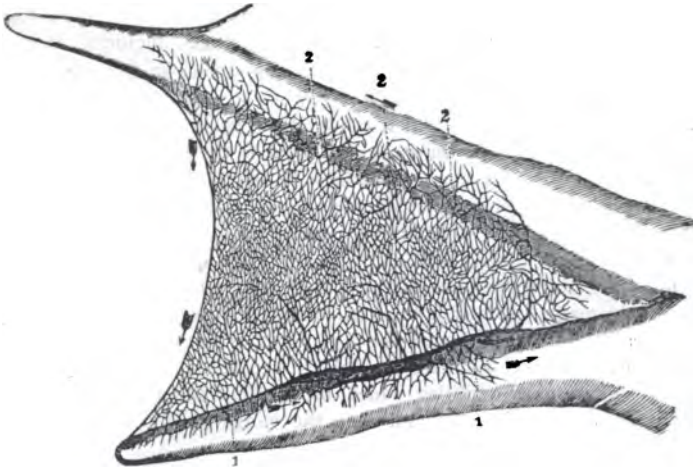
reckoned to contain about one ounce, and, therefore, we are brought to the astonishing realization that two hundred and fifty pounds of blood pass through it in that brief space of time. The fleshy parts of the body are filled with what are called capillaries. An Irishman once remarked, that a gun was a hole with iron made around it; well, a capillary is a hole with animal fibre built around it, and there are so many of them that the human system almost resembles a sponge in vascularity. People who are continually drinking something when the thermometer gets into the nineties, must readily comprehend this statement. They are constantly drinking, and the water is constantly running out of them. Their clothing becomes saturated with their perspiration. Into the capillaries, the heart, through the arterial system, pours the life-giving blood, and after it has deposited its vital atoms, and taken up the worn-out ones, the heart sucks it up through the veins to be renewed.

The blood may be said to carry on a coastwise trade with the various organs and tissues of the body. It goes out freighted with fresh living atoms, and visits every part of the body, even the bones and muscles, and gives that which will repair each part in return for atoms which are no longer useful. These waste matters it carries to the dumping-grounds, called the lungs, liver, kidneys, excretory vessels and pores, and these organs empty them out through the channels nature has provided. The heart is the shipper.

I have thus intruded these illustrations to present the whole matter clearly to the mind of the non-professional reader, and I trust I am fully

understood. Now then, let us suppose the blood becomes impure, so that the heart has no good arterial fluid to dispense to the various organs. The latter are not only deprived of the nourishing properties of good blood, but are left to counteract, as best they may, its corrupt particles. The vital parts are placed in the position of a man with his hands tied, who is called upon, not only to feed, but defend himself. The result is, the human machinery becomes clogged with poisonous

FIG. 6.



A FROG'S FOOT.

The Capillaries as seen in the web of a Frog's foot, under the microscope.

1, 1, are the veins, and 2, 2, 2, the arteries.

humors. These may block up the liver so that it cannot perform its functions properly, and thereby cause irritation, or inflammation, or they may produce a tubercular affection of that organ. They may attack the lungs, producing pulmonary disease. They may irritate or inflame the lining of the stomach so as to impair digestion, and ultimately induce obstinate dyspepsia. In short, no organ or fibre of the body is safe when they are present. These impurities are more liable to affect a person internally than externally. Many persons suppose if there are no pimples, blotches, ulcers, or tumors on the surface, the blood may be considered pure, no matter how much pain or suffering may be experienced inside of the outer covering. This is an error; for many of the most troublesome affections of the hidden portions of the body are caused by blood impurities. Those who have them on the surface are the most fortunate, for, as a general rule, when the blood possesses strength enough to pitch these troublesome particles out on

the surface, it also possesses the ability to protect the internal organs from their corrupting influence.

What I have said in the foregoing relative to the blood, relates rather to *active*, than *latent* impurities. The latter may be defined as those foreign properties in the blood, which, under favoring circumstances, may induce disease. Ordinarily a person having them is unconscious of their presence. But let some poisonous gases or germs infest the atmosphere, and they at once, like the secreted burglar, open the doors of the system, coalesce with them, and induce fevers or difficulties of some kind. I think fevers of all kinds, including scarlet fever and measles, may be traced to latent impurities in the blood. A person could hardly contract small-pox when exposed to it, except for these insidious properties which render the system susceptible. As a female germ cannot produce a child without the addition of a male germ, so these latent impure particles in the blood cannot generate disease without meeting their *affinitive* germ or poison. Seed cast on ground not suited to it produces *nothing*, while simply the pollen blown from some distant field on to just the right quality of soil, seems to meet something equivalent to the ovule, from which vegetation starts up, as if by magic. It is a fact known to many scientific men, that in almost any locality, soil taken from a depth of thirty or forty feet is soon covered with white clover. This can only be accounted for by attributing to this soil germinal qualities, which, brought in contact with the pollen of the clover carried perhaps miles on the wings of the wind, produce this species of vegetation.

THE GERM THEORY.

What is the germ theory? It is the doctrine that disease is communicated to the human system by minute animal organisms generally known under the name of bacteria, which are found in great abundance in both air and water. Bacillus, spirilla, micrococcus, streptococcus, diplococcus, etc., are of the same genus, and have been respectively named according to their varying forms or modes of growth. The reader will be interested in what will be here presented on this subject, and before this chapter is finished it will be perceived that the theory of the cause of disease, as given in the beginning of this chapter, is not the least affected by more recent discoveries. The theory of the causes of disease, as given in the opening chapter, first made its appearance in "MEDICAL COMMON SENSE" in 1857-58, and when that volume was revised in 1869-70 it was repeated in "PLAIN HOME TALK, EMBRACING MEDICAL COMMON SENSE," substantially as the reader finds it at this time. Up to the present moment its correctness remains unchallenged. It is not at all disproved by the part which bacteria plays in human ills.

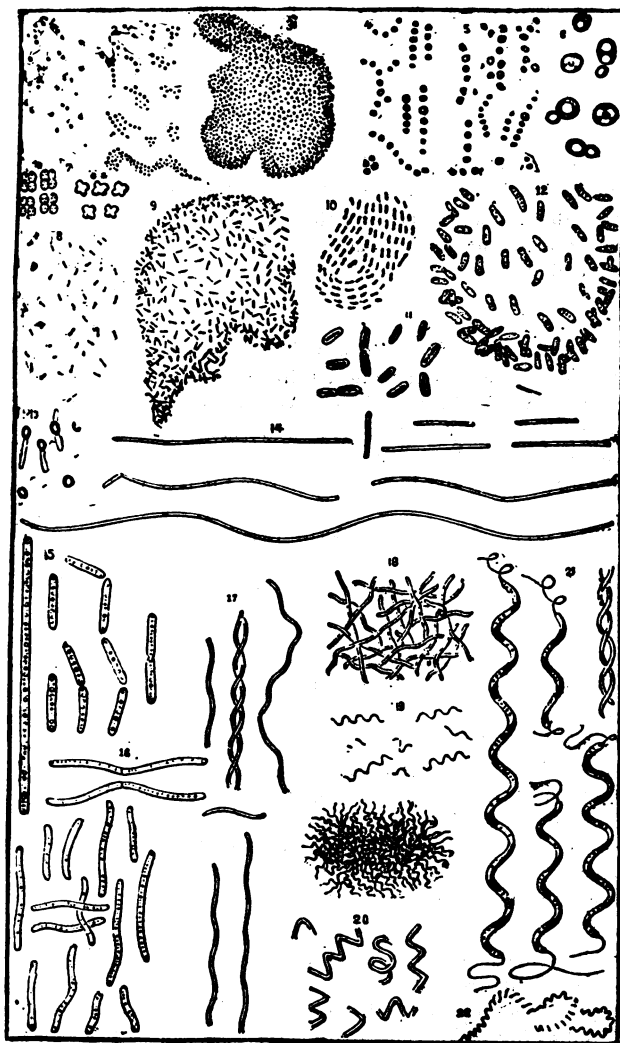
Linnæus, the great botanist, was probably the first scientist to broach the germ theory, nearly 150 years ago, but it received no recognition from the medical profession. From that time until about 1870 scientists who were experimenting to ascertain whether there was anything in the theory of spontaneous generation were continually running against evidence of the correctness of the belief of Linnæus. As late, however, as 1876, "Appleton's American Cyclopædia" states (Vol. XVI., page 843) that "we are still ignorant of the different viruses, contagions, poisons, miasmata, etc. * * * The most widely prevailing doctrine of the present day respecting the origin and communication of disease is that known as the germ theory. Special organic forms known as mycrozymes, bacteria, bioplasts, etc., alleged by various pathologists to be found in contagious fluids, have been the subject of much discussion, some contending that they are of a fungoid growth and enter the body as parasites, others that they are germinal masses derived from animal cells, and due to a series of changes in existing matter under new circumstances; while a third class deny positively that any such germs exist." In "Appleton's Annual Cyclopædia" for 1884, it is stated that "the study of micro-organisms had long been regarded, even by the medical profession, as barren of practical results," but that "it had assumed greater importance during the past year."

A PROPHETIC ARTICLE.

In the issue of *Dr. Foote's Health Monthly* for June, 1876, may be found the following contribution to the discussion, from the pen of the author of this volume: "Pasteur first demonstrated, and the notion is now generally received, that the atmosphere, no less than the water, is filled with minute animal life which only the microscope can reveal. We are in the habit of calling the minute living organisms in air and water bacteria. Much is yet to be learned of these microscopic creatures. But if they are at all like the higher orders among animal life, there must be the bad as well as the good among them. Observe for a moment mankind: We have the comparatively good people, those who are tolerably decent, and the right down cruel and wanton. There are all grades, from those who are aspiring to do good, to those who contemplate only mischief, and glory in it.

"Among the wild beasts, we have species which are harmless and disposed to 'live and let live'; and those even in the same neighborhood who delight in destroying the lives of their more peaceful companions. Among the fishes, too, we find those which would live peaceably if they could, subsisting on the nutritive matter they can gather up without preying upon their fellows, and right among them are others, notably the bluefish, which are so destructive of their good neighbors that they

FIG. 7.



BACTERIA.

[For description, see foot-note on page 29.]

leave a track of crimson blood behind them, as they go through schools of other fishes, in pursuit of food and bloodthirsty diversion.

of "When we look still further down into the vegetable world, and behold the valuable vegetables upon which we so largely subsist, we find they have to dispute their places and growth with the rank and pestiferous weeds which grow side by side with them, unless rooted out by the provident gardener.

"Would we not, then, reasoning by analogy, quickly suspect that the bacteria of the air are yet to be classified into species as follows: (1.) The harmless and nutritive, for science recognizes air as one of the necessary foods. (2.) Those which may possess neither useful nor injurious qualities, unless some conditions arise in the higher animal to invite their depredations; such, for instance, as wounds, or pathological changes which depress the vital forces. (3.) Those which are absolutely poisonous and depredative, seizing upon the comparatively healthy subject, and prostrating him on a bed of disease, and possibly death, while finding easy victims in those who are suffering from diseased conditions of blood, or depressed states of the nervous system.

"It may be that we have a typhoid species of bacteria whose undeveloped germs harmlessly float in the air until some festering corruption or filth furnishes them a nest for incubation, whereupon they develop by the millions, as all lower orders of animal life do, and then carry disease in their path. If this be possibly true, then why not the small-pox, diphtheria, measles, scarlatina, and whooping-cough varieties, all dependent upon certain peculiar conditions to afford them nesting-place for the germs which may, if this theory have any foundation in fact, be ever present in the atmosphere."

That this article was prophetic of what science would eventually reveal, was glaringly evidenced at the great Columbian Exposition in

In the illustration, page 88, copied from the *Microscopic Journal*, may be seen many differing forms of bacteria, and to all of these have been given distinctive names, many of them being rather formidable titles with which we need not try to become familiar. Nos. 1 and 2 are *spherical* bacteria; No. 2 represents that found in vaccine lymph; No. 3 represents an agglomerated mass of such bacteria; Nos. 4, 5, 6 and 7 are found respectively in urine, sour milk, mouldy vegetables and spoiled eggs; Nos. 8, 9, 10, 11, 12, 13, 14 and 15 are *rod-like* bacteria with variations, No. 10 being common to sour beer; Nos. 16, 17, 18 and 19 are sketches of the *vibrio* varieties. Nos. 20, 21 and 22 are *spirilla* (or spiral) bacteria, shown as they appear separate or in swarms. All these figures were drawn by the expert microscopist, Dr. Ferdinand Cohn, from what he has observed under a microscope magnifying six hundred and fifty diameters, or what some would call four hundred thousand times. The whole group as here reproduced is from an excellent monograph in pamphlet form entitled "Bacteria; An Account of their Nature and Effects, Together with a Systematic Description of the Species," by T. J. Burrill, Ph.D., Professor of Botany and Horticulture, of the Illinois Industrial University.

Chicago in 1893, where were exhibited the great variety of bacteria that the scientists had corralled and confined, not in cages like the animals in a zoological garden, but in small vials, each labelled with the disease of which they seemed to be the responsible carriers. These germs were indeed classified. The alleged germs of consumption, typhoid fever, erysipelas, diphtheria, cholera, measles, scarlet fever, and an infinite variety of other contagious diseases, all bottled, securely corked and labelled for the inspection of those who could use the microscope. Facetiously rhyming on these germs, our able surgical contemporary, Dr. Helmuth, thus speaks of one of the varieties :

"Oh ! powerful bacillus,
With wonder how you fill us
Every day !
While medical detectives
With powerful objectives
Watch your play !"

Moreover, they have been given distinct names, according to their nature and effects ; they have been pictured in a manner that shows they are as numerous and varied as the photographs of the thieves, pickpockets, and housebreakers in the Rogues' Gallery at the Central Police Station. Nor is this all. For, if the reader will be patient and pursue this matter further, he will discover that the scientists have found many useful bacteria which may be employed advantageously in butter and cheese-making and various other useful economic processes, as foreshadowed in the article quoted from the *Health Monthly*.

It is more than probable that the nauseating odors coming from anything undergoing putrefaction are caused by the bacteria that are attracted thereto. We shall see further on how butter is improved in flavor and smell by the presence of the bacteria that are cultivated, for the purpose, by dairymen, and the existence of bacteria of this sweet smelling variety naturally suggests the possible existence of that of an opposite nature. We may have microscopic skunks as well as those which are visible to the naked eye. Will the scientists brave the repulsive odors and approach the decomposing carcass with microscope in hand on seashore or field to find out ?

Just after writing the above an article came into my hands by G. Clarke Nuttall, in *Knowledge*, which tells us that the peculiar smell of fresh earth is caused by the presence therein of "myriads of tiniest organisms," which the writer thinks belong to the fungus family. It was thought when they were first discovered that the minute organisms that produce fever and ague, chills and fever, etc., were members of the vegetable kingdom, and one physician called them the "ague plant ;" but they have since been relegated to the animal kingdom, as will soon

be observed. If, therefore, the fresh ploughed ground owes its odor to the presence of minute organisms, we already have this additional suggestion that perhaps disagreeable smells arising from decomposing substances may in all cases be due to bacteria. "It is a new revelation," says Mr. Nuttall, "to find that it is the outcome of their activity." The earth at certain seasons swarm with them.

It may not appear disagreeably egotistic in this place if I relate how the views contained in the article from the *Health Monthly* were regarded by a promising young scientist who had just graduated from the College of Physicians and Surgeons in the City of New York, in the spring of 1876. As he was fresh from college, and had doubtless heard of all the latest discoveries relating to disease, I naturally regarded his judgment as of some value in passing upon the speculations that were exercising my brain. I verbally presented to him the substance of the article herein copied on the subject of bacteria. He listened impatiently to what I had to say, with a countenance which betrayed the greatest amount of incredulity, and when I had finished, he exclaimed: "You cannot prove your theory! It has absolutely no value! It is not supported by anything science has revealed!"

Many years have passed since this judgment was rendered, but the same young scientist, now a middle-aged man of some prominence, if he will look up bacteria in the Standard Dictionary (Funk & Wagnalls' Co., 1895), he may see a great variety of these interesting microscopic specimens illustrated, and yet many more have been discovered. The dictionary presents only about a dozen of the most mischievous ones. Fig. 7, on page 28, shows a choice lot of them, but if the reader will turn to a medical dictionary he will find about two hundred or more, all bearing a distinctive name.

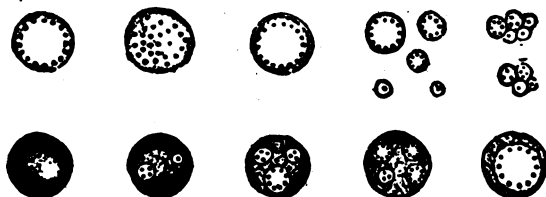
GERMS OF MALARIA.

For a long time it has been thought that malarial fevers are attended with the invasion of the blood by some low and minute form of plant or animal organism, now called microbes. These can only be discovered by high power microscopes and expert manipulation. It is now pretty generally accepted that the animal parasites described by A. Laveran are the cause of the aching and shaking of fever and ague. He has described several forms, which may, however, be the same intruders under different guises, or at different stages of development. Those which we have chosen to give of his illustrations are what he calls "bodies No. 2," which he found most abundantly in the blood of malarial patients.

These are technically called the corpuscles of Laveran. The first line represents the bodies themselves of various sizes, magnified 1,000 times, while in the second line they are seen in or upon

the red corpuscles of the blood, which in course of time disappear, seeming to be eaten up by the parasites. Some red corpuscles show clear spots where the young invader has just begun to grow. The full grown parasites sometimes show at their borders filaments, moving with great rapidity. They are very long and slender, and can sometimes be seen moving freely like eels among the red corpuscles with such rapidity that it is difficult to keep track of them.

FIG. 8.



LAVERAN'S GERMS OF MALARIA.

CHEESE AND BUTTER-MAKING GERMS, ETC.

Under the head of "Cheese-making Bacteria," in the *Literary Digest*, of June 18, 1898, may be found the following: "The 'ripening' of cheese, so as to produce the characteristic texture and flavor of any desired variety, has been brought to a high degree of perfection by Dr. Olav Johan Olson, of Norway. * * * Dr. Olson, it seems, has investigated various cheeses, and has caught and cultivated their microbes. Then he has reversed the process, and used his cultures to produce the various cheeses from which he started. The kinds of microbes are not many, but by their combinations in different proportions, different results may be obtained. The milk is sterilized and heated to 70°-75° C., and the store-room is kept guarded against foreign microbes. Those that are desired are added in the requisite proportions, and their vigorous growth is of itself enough to overcome the influence of accidental strays. The production of the kinds of cheese is no longer an affair of the laboratory; but Dr. Olson will take your order for Gorgonzola, Stilton, or Camembert, and will furnish the precise description required at a cost satisfactory to your pocket and to his own."

It is not necessary, however, to go to Norway or elsewhere to find useful bacteria of a rare kind. While the World's Fair was in full blast in Chicago in 1893, a can of milk from Uruguay was received in apparently damaged condition. It had been for weeks on the way, and when opened it was found to have a peculiar bitter taste. It was submitted to Professor Herbert W. Conn, of the Biological Laboratory of Brooklyn Institute, at Cold Spring Harbor, Long Island. During the summer of

1893 he was experimenting with the bacteria of milk at the Great Exposition. The sample of milk which had travelled nearly half around the globe was found to contain just what Professor Conn had been looking after. He had already discovered some forty different bacilli in milk, and this one he labelled Conn's B., No. 41, and this at once became famous. It not only improved the keeping quality of butter, but greatly added to its flavor; so much so, that it found its way very soon into three hundred and fifty creameries in a dozen or more States. It would not make good butter of poor cream, but it made a delicious quality from good cream; one which possessed an inviting aroma and a nutty flavor. Butter made with this bacterium brought a higher price in market than any other. So we can get the best quality of butter at home if we must go to Norway for cheese, and this is due to bacteria of the useful variety.

There are other economic uses to which the kinder species of bacteria may be put which have been presented by Professor Marshall Ward, in his presidential address, before the Botanical Section of the British Association. He is said to have "dwelt at considerable length on the many industrial processes which depend more or less for their success on bacterial fermentations. As reported in Appleton's *Popular Science Monthly*, he says: "The subject is yet young, but the little that has been discovered makes it imperative that we should go on, for the results are of immense importance to science, and open up vistas of practical application which are already taken advantage of in commerce. A bacillus has been discovered by Alvarez which converts a sterilized decoction of indigo plant into indigo sugar and indigo white, the latter then oxidizing to form the valuable blue dye, whereas the sterile decoction itself, even in the presence of oxygen, forms no indigo. Certain stages in the preparation of tobacco-leaves and of tea depend on a carefully regulated fermentation, which must be stopped at the right moment, or the product is impaired or even ruined, while in flax and hemp the best fibres are separated by steeping in water till the middle lamella is destroyed. Not every water is suitable for the process, but only that containing a particular bacillus, which destroys the pectin compounds of the lamella and leaves the cellulose. A process depending on this fact has been patented in the United States. The steeping of skins in water preparatory to tanning involves bacterial action for removal of the hair and epidermal coverings; and the swelling of the limed skins is a fermentation process. Hay and ensilage have to go through fermentations involving bacterial action. The various flavors of butter and cheese are each produced by special bacteria, and the cultivation of them has become a considerable business, so that the production of whatever flavor may be desired has become a matter of reasonable certainty." It has been found that clover and many other plants that

accumulate nitrogen from the soil, or, in other words, convert nitrogen from the inorganic (mineral) world to the organic (vegetable) world do this by the aid of bacteria on the roots of the plant. The *Medical Press*, in a plea for microbes, says: "An American contemporary points out that there are about a thousand species busily engaged in the destruction of wood, and, were it not for their intervention, all the trees that ever grew would be standing to-day, living, or it may be dead, but in any case as solid, as sound, and as firm as when they ceased to grow, and all life must have been choked out ages since. * * * They are accused of contaminating our water, but it is equally certain that were it not for their ceaseless activity all the water in the world would be a concentrated solution of excrementitious and noxious products, the disintegration of which is due to these little organisms. Our very digestion depends upon them to a great extent, and if they were withdrawn from circulation we should very shortly become painfully aware of the fact. No, let there be no class distinctions; every community has its black sheep, and these should very properly be branded with the mark of infamy. The existence, however, of these misconducted atoms will not justify extending the anathemas to the countless millions of their species in whom, and with whom, we live and move and have our being."

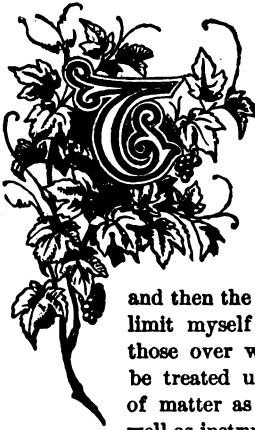
The capacity of bacteria for reproduction is evidenced by Conn, who calculated "that a single bacterium, by growth and division under favorable conditions, could fill the ocean in five days, multiplying, as it does, in a geometrical ratio." They are in and about everything, and are far more numerous than any other species of living thing. They are quite as busy as any of us in doing the world's work as well as in perpetrating mischief. It is to be hoped that there is between the good and bad bacteria as much destructive conflict as there is between the different races and nations of mankind, and that this positive check to over-production may continue in the bacterial world. Let us also hope that the more highly civilized and useful bacteria may ultimately extinguish the savage and barbarous hordes of their species.

ARE GERMS PRODUCERS OR SIMPLY BEARERS OF DISEASE?

Returning to the baser sort, the question is not yet settled whether it is the bacterium itself or the poisonous source from which it emerges, that conveys disease. Professor Jaccoud asserts that "bacteria are only bearers of infection, as a fly may become the carrier of small-pox." Panum, Richardson, and others, according to "Appleton's Annual Cyclopædia" (Vol. IV., page 444), have discovered "that the septiciferous fluid cannot be deprived of its virulent properties by either boiling, evaporation, or combination with acids in the form of salts," and adds, "that as no life could survive such operations, it must be inferred that the toxic (poisonous) agent is not the zoophytes themselves, but a

CHAPTER II.

THE CAUSES OF NERVOUS DERANGEMENTS AND AFFECTIONS OF THE BLOOD.



THE subject of this chapter opens a boundless field for the investigation of physiologists. Indeed, should an attempt be made to trace out all the influences, immediate and remote, which tend to destroy the mental and nervous equilibrium, and render the blood a fountain of death rather than life, many volumes like this would be filled, and then the task would be unfinished. I shall, therefore, limit myself to an explanation of the principal causes—those over which we have the easiest control. Each shall be treated under its appropriate head, with such variety of matter as may be necessary to make it entertaining as well as instructive.

Ignorance.

This is the vehicle, loaded down like a trolley-car, or an excursion steamboat, that conveys into the system nearly all the nervous derangements and affections of the blood which afflict the human family. Plato long ago said that "ignorance is the root of misfortune." A large proportion of all the evils of which the essays in this chapter will complain, really spring from one common root—ignorance. Errors in eating, drinking, sleeping, dressing, ventilation, sexual isolation, sexual association, medicating, etc., the bad habits of childhood and of adult age, may be traced directly to ignorance. It casts a black shadow over every hearth-stone—it makes a dark corner in every institution of learning—it clothes with bigotry and intolerance thousands who claim to be the apostles of religion—and it

FIG. 10.



TRYING TO LIFT HIMSELF OVER THE FENCE BY THE STRAPS OF HIS BOOTS.

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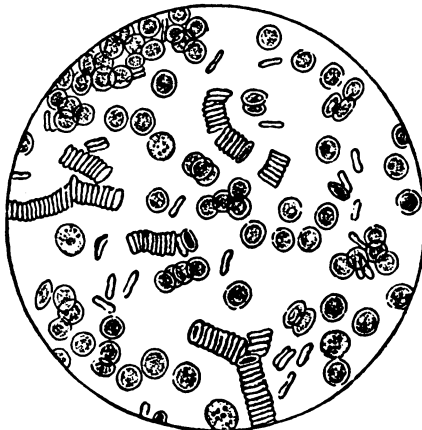
even revels in the halls of science, putting smoked glasses over the eyes of those we are taught to revere as philosophers and sages. It makes the peoples of all our planet play "blind-man's buff," where, on every side, there are moral and physical pit-holes ready to engulf them. No one sees his neighbor in his true character, and if he grasps for him, only catches costumes or professions. We are like moles, with only the rudiments of eyes, groping above the ground inhabited by those burrowing beneath. Thanks to Good Old Mother Nature, we have powers which those little quadrupeds have not, and if we will but place ourselves openly to the light which is ready to shine upon us, if we will be tolerant of each other's opinions, weigh all things, and hold fast that which is good, our posterity, if not we, may behold the brightness of the "good time coming."

There are two kinds of ignorance—*real* and *wilful*. The latter is the outgrowth of the former. No sane person will voluntarily sacrifice health through wilful ignorance, unless that wilful ignorance is plumply backed by some of the genuine article. Like the "Jacobs," "Original Jacobs," and "Real Original Jacobs," they are all Jacobs after all. A person may shut his eyes to a disagreeable truth—resolve within himself that he will not see it, and impatiently trample it under his feet, and yet, did he fully comprehend the consequences, he would desist from his folly. A glutton may overload his stomach, with a full knowledge that he is violating a physical law—knowing that this violation will certainly render him physically uncomfortable. But were he sufficiently informed to have presented clearly to his mind the latent as well as active derangements one such violation engenders; could he but see the innumerable ills which will remotely spring from a cause apparently so slight, is it to be supposed he would sacrifice years of physical comfort for a momentary gratification of a morbid appetite? A thoughtless young woman may dress imprudently to attend a fashionable ball, covering but partially, or leaving completely exposed, portions of her person which she habitually wraps in flannels or furs. She is told of the danger, but laughingly retorts, "I know it, but I am bound to have a good time." This may be attributed to wilful ignorance, but a stratum of real ignorance lies at the bottom of it. She has an imperfect knowledge of how fearfully and wonderfully she is made, and how one slight physical derangement may lay the foundation for many diseases; to future years of mental and bodily wretchedness; and finally a premature grave. "A short life, and a merry one!" she gaily ejaculates, without knowing that such a thing is a physical impossibility; but it is, unless she ends her brief hours of frivolity by cutting her throat, or otherwise abruptly terminating her existence in one short moment, for all recklessness leads to mental and physical suffering; and though life may be short under such circumstances, it

abundance of the red, giving undue redness to the skin, and predisposing a person to inflammatory affections and congestions. In short, the blood must possess very nearly that proportion of red and white corpuscles which nature originally instituted, or disease will present itself.

It now having been shown that a free circulation of vital or nervous electricity, an untroubled mind, and good blood are essential to health,

FIG. 9.



PICTURES OF WHITE AND RED CORPUSCLES.

Both the red and the white blood corpuscles show some variations in size and shape, even in health, but some of the most marked variations from the normal or usual appearance are considered distinctive evidence of disease and may aid the examiner to determine what diseases exist.

It requires only a moderate exercise of common sense to perceive that all diseases, excepting simply those induced by poison or accident, originate from a disturbance of these indispensable conditions. There may exist hereditary organic weaknesses, but even these had their origin in conception, or in foetal life, from the disturbed mind or vital functions of the parent, thus not allowing a single exception to my theory.

The attention of the reader will next be directed to the principal causes of nerve and blood derangements, or the *primary* causes of disease. But, before concluding, let me ask if the foregoing does not lead to the irresistible conclusion, that the first duty of a physician to a patient is to see that his nervous system is set right, his mind emancipated from all depressing influences, and his blood restored to that condition which enables it to impart the tint of health to the skin, strength to the muscle, and rich and abundant juices to all the tissues?

specific poison produced by them by a process of fermentation in the putrescent fluid." If this view be correct, it is the poison with which the bacteria are, so to speak, bathed, that does the mischief of conveying disease, in which case the causes of disease as mentioned in the beginning of the opening chapter, already embrace the newly discovered agent, inasmuch as these authorities call it an indestructible *poison*. But if it be finally determined that the bacterium itself has power to produce a specific disease, I predict that it will also be found that the microbivorous germ can only find lodgement in those individuals who possess some impurity or abnormal condition of blood, or a devitalized nervous state which is capable of giving them nesting. Your hale, hearty, vitalized, and mentally exuberant neighbor will go unscathed. If otherwise—that is to say—if it be finally discovered that there are some bacteria which can take hold of a perfectly healthy man and prosecute him on a bed of sickness, they will certainly be such microscopic creatures as bear some analogy to visible poisonous specimens of animal life, like the venomous reptile, the deadly insect, etc., and it can be truly said that the victim of such bacteria has been laid low by poison, the same as if he had been bitten by a rattlesnake. In this case we have the bacterial variety indicated as the third class in the prophetic article in my *Health Monthly* in 1876, as already reproduced in this essay.

It is found that bacteria are ever present in everything that is undergoing decomposition. They seem to be the necessary scavengers of air, water, and of decaying substances upon the earth. As Dr. Ball puts it, "without microbes to assist in effecting chemical changes, the earth would reek with organic filth." It would seem to be in the order of nature to have these microscopic creatures enter into all lifeless bodies, and assist in their disintegration. It may also be consistent with this law that they should enter into all dying individuals, and help forward the destructive process. The dying process may be said to have commenced when the first departure from a healthy condition takes place, however slight that departure may be. If so, it is but natural to find the blood of the very sick man seeming with these destructive little creatures. In all advanced stages of disease when the doctors look for them, they are found more numerous than the fishes in the sea. There is, therefore, nothing to retract or amend in the opening portion of this chapter.

There are abnormal conditions of blood which can hardly be called impurities, active or latent. For instance, a person may have an insufficient quantity of blood, resulting from which he is weak, pale, and cadaverous. There may be an excessive supply of the white corpuscle, or an insufficient supply of the red corpuscle, producing paleness and lassitude, but not necessarily leanness, as people so affected are often fat. There may be an insufficient supply of the white, or a super-

is always long enough for nature to inflict her penalties ; for a person cannot die without disease, or physical infirmity, except by accident, assassination, or suicide, and when a few days or weeks of reckless hilarity are followed by months of mental and physical distress, even if death does come to the rescue, what becomes of the theory, of "a short life, and a merry one?"

Let the foregoing two instances suffice for an illustration of what is generally called wilful ignorance. We see that this species has its origin in real ignorance, and that a better understanding of the laws of life and health would speedily put an end to recklessness entered upon with but a partial knowledge of the consequences.

REAL IGNORANCE.

Real ignorance is the fearful enemy of mankind. Let us commence at the very beginning of the human being. How many know the essential conditions to bring into the world a healthy child? A man and woman love each other, or think they do, or they do not, but it is expedient to marry, and they do marry. The next thing you hear is, that the wife is pregnant. How did she become so? Accidentally, probably, for nearly all children are the accidents of gratified passion, instead of the products of willing parents who premeditated and prepared themselves for so important a work. Most married people are ignorant of the fact that their own physical conditions at the moment each yields the germ, which is to start into existence a human being, has an everlasting influence upon that being. Many a child has been conceived when its father was lounging about home on account of sickness, and to-day suffers physically, and perhaps mentally, from the effects of that paternal illness. There are thousands of children to-day with disordered nervous and vascular systems who are so because they were conceived at the "making up" of quarrelsome progenitors. Many a child is the offspring of a rape, perpetrated by a brutal husband upon an unwilling wife, and this offspring goes through life with a weakly nervous system as a consequence.

FIG. 11.



THE CREATURE OF ACCIDENT.

Men and women marry, ignorant of the laws of mental and physical adaptation. This botchery of human procreating machinery goes blindly at work turning out babies. The babies do not ask to be born. Life and disease are both thrust upon them. Poor things! The doctors will earn half their bread and butter from these wretched specimens of humanity, if the unfortunates manage to live long enough to

earn anything. The ignorance of parents prior to, or at the moment the embryo of a new being is created, brings forth only the first instalment of disease with which it will have to contend. Here and there a prudent woman may be found who knows to what extent the offspring within her womb is physically influenced by her habits of thought and action. The majority do not. Few men, when treating pregnant women with unkindness, are conscious of the injury they are inflicting upon the miniature being in embryo. The period of utero-life is one fraught with danger to the health of the defenseless little creature which nestles as shrinkingly within the walls of the uterus before as it does timidly to its mother's bosom after its birth.

The babe is born ! What next ? Not one mother in a thousand knows how to rear a child in a way to promote health of nerve and blood. She feeds and clothes it improperly during infancy and childhood ; she drugs it almost to death, or lets some doctor do it, for ills proceeding from one or more of the causes already alluded to. Then the child must be vaccinated. How few know the fact that scrofulous, syphilitic, and other impurities are taken from the arms of diseased children, and inoculated into the blood of those who are free from such impurities ! The knife of the father, or the needle of the mother, or the aid of a physician with whom the parents are entirely unacquainted, is employed to perform this important operation, when only those combining skill with the greatest integrity, should be trusted, if it be deemed best to have it done at all. So that, from this source, a new element to corrupt the blood is imparted to the infant. As the child advances in years, a new and strange passion seizes it, often before the proper age of puberty. Ignorant of the complexity and functions of the procreative organs, it falls into bad habits in efforts to gratify a natural passion, and further nervous and blood derangements ensue. If it be a female, she arrives at the age when menstruation begins, untaught regarding this function. She observes the blood issuing from her body, and frightened at its appearance, attempts to stay the flow. I have many times been consulted by pale women suffering from menstrual irregularities, which were induced in childhood by attempting to arrest the menstrual discharge, by applying cold water, ice, or snow to the parts. Those who do know enough of the function to avoid this error, do not know how necessary prudence is during its performance. In rural districts, the out-houses are often built to project over streams, or they stand on hill-sides, so that draughts of air are continually passing up through them. The best of them in the country are poorly built for the protection of health, and especially the health of women. Many cases of menstrual irregularities, particularly in those who have but just commenced the performance of the function, may be traced to exposures in badly constructed places of this kind. Keeping the feet dry,

and the bosoms safe from changes of temperature, when they have been made sensitive and susceptible to disease by excessive dress, are precautions too often neglected. In some cases too little, and in others

FIG. 12.



MOTHER GRUNDY BLINDFOLDS THE MOTHERS OF THE RACE, AND THE CHILDREN, TOO.

too much, exercise is indulged in during the menstrual flow. The Moral Education Society of Chicago tells us, in one of its tracts: "The mother holds the key to the innermost life of her child, and she should impart the knowledge which, if in possession of sons and daughters, might save to many the wreck of health and happiness which often attends the outset of married life." But how are mothers to impart to

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children knowledge which they, too often, do not themselves possess ? From their own experience they might instruct their daughters in some things, but they cannot draw from their personal fountain of knowledge all needed instruction for their sons. In many important matters women are not encouraged to know much.

AIR-BRAKES ON THE CAR OF KNOWLEDGE.

Dr. Alice Lee Moqué, writing the author from Washington about her difficulties in gathering up all the useful knowledge she desires to obtain, says : " I see it is claimed that our Medical Museum has the finest specimens in the world, and that the Museum Library is one of the best. Both of these are free to the public, but as the librarian refused to let me have Havelock Ellis's book on the ' Psychology of Sex,' I guess I'll have to don Jonathan's trousers if I am to be intrusted with anything heavy, or along the line of sex. And yet, could you have seen the beardless boys who were given the freedom of the library, I imagine you would have considered me quite as capable as they, of understanding and digesting anything there. It seems rather ridiculous that my boy, only sixteen, who has never read anything more technical than his school-books in his life, can secure books that will be refused to the mother who bore him, because, forsooth, she is a female, and not supposed to know anything about sex, perverted or otherwise. It is galling to a woman who has to endure the same thing in every direction the very moment she desires to know anything or do anything outside the beaten track." This complaint is not without reason, and the same sickly sentiment which forbids Mrs. Dr. Moqué to have such a work as she sought from the library prevails so widely in society, that most mothers are willing to go groping through life ignorant of many essential truths, and bring up a family of children no more equipped with knowledge pertaining to the sexes than they themselves can gather up from some clandestine and often misleading source. How, I again ask, can such mothers give the greatly needed instruction in physiology and hygiene to their children ? Ignorance leads ignorance hand in hand, in congenital blindness, to the abyss of disease and death.

FALSE MODESTY LEADS TO HYGIENIC ERROR.

The coyness of young people of both sexes, but especially of young women, in attending to the " calls of nature," are fruitful sources of nervous and blood derangements. Children are brought up to regard the necessary attentions to the bladder and bowels as something so indelicate as to require the greatest privacy, so much so, that if places constructed for such purposes are not entirely shielded from observation, a young man, or a young woman, will go all day, or possibly for several days, without attending to two very important functions with any

degree of regularity. The results are, the blood becomes poisoned by the retention and absorption of waste matters, the nervous energies of the liver, bowels, kidneys, and bladder become paralyzed, and if the victim be a female, the pressure of water in the bladder in front, of the excrementitious matters of the bowels above and behind, displaces that sensitive organ, the womb, and then follow all sorts of ills to make life wretched. What kind of etiquette is this which teaches people to be ashamed of the functions an All-wise Artificer has instituted to preserve and keep active the most complex machinery ever made by His hand? Is it indeed a disagreeable task, one we are to be ashamed of, to dispose of the useless portions of the liquids and solids we have put into our mouths? May we not better teach our children to be ashamed of gluttony—of besmearing their mouths with vile tobacco, and loading their breath with the vapors of unwholesome drinks! May we not better place a gate at the door wherein so much that is injurious enters, than to stop up the outlet from which many things purer depart! Especially when absent from home, among people they have never seen before, and may never see again, are coyish young people—and some old ones—foolish in this particular; and because appropriate places for physical relief cannot be entered without observation, irregularities are inaugurated which finally bring them to their beds, and their doctors. People in advanced life, unless sorely afflicted with mock modesty, are usually more sensible in regard to this matter, and still, they are not sensible enough for their own good, nor have they a particle of sense, in many instances, in giving right impressions to their children.

Grown-up children know too little of themselves to instruct those who come after them. As before remarked, mothers who have the care of children, and who should, consequently possess all attainable information regarding the human system and its wants, often know the least. Picture to your imagination women, well-informed on most subjects, bearing in educated circles the reputation of being intelligent, calling on a physician, and trembling with anxiety on account of a tumor they had discovered, from which they apprehended the most painful consequences. An examination is made, and what they regard as a tumor, is found to be simply the neck of the womb, in a perfectly healthy condition, and in the place Nature assigned for it! Such instances have occurred in my practice. One young married woman, of unquestionable popular intelligence, consulted me concerning a supposed cancer. Her mind was terribly exercised about it, and she hoped her case was not incurable. On examination, the cancer proved to be simply the clitoris, although somewhat inflamed by her frequent manipulations after she first discovered it. At the outset, it was only the natural organ such as is found in all healthy women; but she could not let it alone when she discovered it, thinking she "must do something

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for it," and the growing irritation resulting from her attentions to the supposed cancer, she attributed to the progress of the disease. Women have consulted me who supposed leucorrhœa was simply a natural and healthy discharge. With such ignorance on the part of mothers, especially when they are so thoroughly saturated with fashionable social nonsense, we can hope for little improvement in children. We must look to schools, ultimately, for our physical redemption, and if proper means will be adopted by those having charge of our institutions of learning, great things may be effected in one generation. In the chapter headed "The Prevention of Disease," I shall make some suggestions which should be pursued in all places where young people are taught. In a country like ours, so full of school-houses, ignorance in reference to vital matters pertaining to physical life would be utterly inexcusable if the right course were adopted by our boards of education and school committees.

I will now conclude this part of the chapter with the remark that much that will appear in subsequent pages might be embodied under this head, for ignorance lies at the bottom of all bad habits and usages. But under separate heads can be given greater prominence to many things to which I wish to call especial attention.

Violating the Moral Nature.

Many people have an idea that if they pay fair respect to what are usually understood as physical laws, all will go well with them so far as bodily health is concerned. But few seem to understand the sympathy existing between the moral and physical man. If an individual, to-day, has sufficient physical strength and endurance to suppress the voice of the inward monitor—the conscience—and retire at night with a relish for sleep, after he has perpetrated some great moral wrong, he imagines he will always be equally successful in crushing out his better nature. But if no other cause intervenes to render his nervous system, and hence his mind, wretchedly sensitive to all such violations, the effort required to put down conscience will, in time, do it, and all at once he will find himself plunged into a mental hell from which, and into the sulphurous one pictured by ancient theologians, would be a grateful deliverance. We cannot persistently do those things which we feel to be wrong, without wearing away (by slow degrees, perhaps, in some cases), the nervous strength which, to-day, sustains us in violations of our moral sense. If, by a dishonorable course of life, a man may have attained wealth, and that wealth has given him position, and during all this time he has managed to preserve a fair degree of health—possibly excellent health—the loss of property and of position attained through it, brings him to his reflections, and the doctors have no easy task to cure him of ills which almost surely overtake him. Then, if

not before, the voice of conscience, which has been contumaciously suppressed, keeps him awake at night-time, for the lessons which should have been received from day to day for years, are crowded upon him in one moment, and hypnotics and anodynes are of no avail in bringing sleep to his eyelids, and repose to his agitated nervous system. Nor is it sufficient that the moral nature be simply preserved, in order to make a man strong and noble. It must be built up. As physical exercise develops the muscle, so exercise of the moral faculties develops the moral strength of the man, and this moral strength makes him mentally buoyant, courageous, and happy; and this condition of mind promotes digestion, gives regular pulsation to the heart, action to the liver and kidneys, full and deep respiration, and muscular life and elasticity.

It is not necessary that a man should do as his conscientious neighbor, or as society dictates. So long as mankind are not run in one mould, there will be diversity of opinion, and each man will form, from investigation and reflection, a moral standard, considerably his own, or at least modified by his individuality. It is not what others say of us individually, or what people of other nationalities say of our nation, that will make us great, powerful, and happy. It is what we can *feel* regarding ourselves; it is the self-respect which a noble life creates; if our consciences can unequivocally pronounce the verdict—**RIGHT**—we are at once invincible—we are happy—we are healthy. The applause of others may tickle our vanity, at the moment we think it misapplied; but the applause of conscience sinks a shaft of moral strength, an unfathomable pleasure, down into the very soul's centre.

It does not simply dwarf a man morally to devote his entire energies to the accumulation of wealth, or the attainment of some other selfish object. It changes his physiognomy, or at least prevents it from acquiring a look of nobleness. An individual may not be legally dishonorable, while straining every nerve for the accomplishment of a selfish purpose, but the simple neglect of his moral nature makes him less a man, not only in a moral but in a physical sense. The nervous stimulus, or life force, has been consumed for the realization of the one object of his ambition, and the various organs of the body have been cheated of that which belonged, in part, to them, so that a dwarfed soul looks out of a body which has not been healthfully developed. He may not be a shrunken man physically, he may be fat—plump as an

FIG. 13.



A MAN WHO HAS NEARLY
WORN HIMSELF OUT IN THE
SERVICE OF THE DEVIL.

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alderman ; if so, much of the vital forces he wastes in his aggrandizement are needed to spiritualize this gross corporeity. Have you never noticed how much difference there is in the physical appearance of a good fat man, and a fat man who has neglected his moral development ? From the former, the soul shines out like a light from a window ; the latter has no more spiritual radiancy than the wax figure of a sixpenny showman. So that sins of omission, as well as of commission, against the moral nature, affect the physical well-being. There is no one way, perhaps, in which the moral man is more tortured than in the pursuit of wealth and position. In fact, this part of man's nature is often sacrificed entirely for the realization of these objects in our competitive world.

HOW IT WAS VIEWED BY A NOTED PREACHER.

Fig. 14.



"ONE WHO HAS GAINED NOT ONLY
AVOIRDUPOIS, BUT INTELLIGENCE
AND GOODNESS."

him ten thousand, and you have built him up to the knees ; give him twenty-five thousand and you have built him to the loins ; give him a hundred thousand, and you have built him above the heart ; give him two hundred thousand, and he is made all over. Two hundred thousand dollars will build a man in this world ; two hundred and fifty thousand will make a good deal of a man ; five hundred thousand makes a splendid fellow, as the world goes. The great trouble, however, is that although the materials may not be very costly, as God looks upon them,

The late Henry Ward Beecher, in one of his sermons, presented something interesting in this connection. " Did you ever," he asks, " see men made in this world ? They had no great wisdom ; they had no great honor ; they had no great heroism ; they had no great patience ; they had no great meekness ; they had no great wealth of love ; but they had a certain muck wisdom ; they knew how to thrust their hands in where dirt was to be moulded ; they knew how to amass property ; they knew how to construct ships and houses ; they had a kind of ferreting eye, a sort of weasel sagacity ; they were keen and sharp ; they were said to be prosperous, thriving men ; they were being built up according to the estimation of men. Give a man five thousand dollars, and you have laid the foundation on which to build him—you have got his feet built ; give

men find it difficult to build themselves in this way. Besides, they are very easily unbuilt. Where a man is merely what he owns, it does not take long to annihilate him. You can take a man's head off with a hundred thousand dollars; you can cut him in two with two hundred and fifty thousand; you can annihilate him with a kick of five hundred thousand, so that there would be nothing left of him but smoke!

"There are thousands of thousands of men, of whom, if you take away their houses, and ships, and lands, and fiscal skill, and such other qualities belonging to them as they will not want in Heaven, and cannot carry to Heaven, there will not be enough left to represent them there of righteousness, and godliness, and faith, and love, and patience, and meekness, and such like qualities. They have used all these qualities up for fuel for their machine. It has been their business in life to sacrifice probity that they might be rich; that they might gain power and influence; that they might make their hold on the world broader and stronger; and if they cannot carry forth these things which have been the objects to the attainment of which they had devoted all their energies, what is left for them to go out of life with? You see not only single specimens, but whole ranks of the dwarfed, insect class of men, patting each other on the shoulder, registering each other, and speaking of each other as 'our first men,' 'our largest men,' 'our influential men,' 'our strong men;' and yet, if you were to take away from them that of which the grave will divest them, you could not find them even with a microscope!

FIG. 15.



"THE REVERSE OF THE OPPOSITE ILLUSTRATION. BEHOLD THE CONTRAST."

"Do you not know just such men? If you were to think of those belonging to your own circle of acquaintance, and ask, not what this and that man are worth as factors in material things, but what they are worth as God looks upon them, what they are worth when measured by their righteousness, and faith, and love, and patience, and meekness, those things which are to make up our manhood

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in the eternal world, would you not find among them those of whom, if their selfishness, their heartlessness, their grasping skill, their worldly wisdom were taken from them, there would be scarcely any thing left ? ”

NO GREAT NAMES ON FENCES.

It often happens that such men—men who, instead of making great names by pursuing some moral or beneficent object, simply write their names on checks, business receipts, carve them out on trees, pencil them out on barns, on walls, and on the rude partitions of summer-resorts—awaken to a consciousness of their moral impoverishment after they become somewhat sated with wealth and petty enjoyments ; and then there is a summary precipitation ; a break-down of energy, of pride, of ambition, of appreciation of what they have attained, and so much disappointment and mental wretchedness, that health fails, and oh, how hard it is with hygiene, with tonics, with therapeutical electricity, with every means science and skill have discovered, to build up such men ! They are the worst physical wrecks that enter a doctor's office ; and although they say they would give all they possess for physical health and mental quietude, they cling tenaciously to the gold they have so long worshipped. How can they afford to part with it ? All their generosity, all their love of neighbor, all their love of humanity, and every good quality they brought into the world with them, have been melted into the glittering lump.

Although, as before remarked, there is a greater tendency to sacrifice the moral nature in the pursuit of wealth and position in this world of pride and competition than in any other way, there is a manifest carelessness in regard to the preservation and development of the spark of nobleness within us in every department of life. Few men and women, comparatively, are fully truthful. Few treat their neighbors with exact justice ; too many sacrifice peace of mind for momentary pleasure ; thousands are daily and hourly doing what they *know* to be wrong. After all this violation of the moral sense come self-accusation, remorse, wretchedness, loss of sleep, loss of nervous vivacity and strength, and finally the whole system becomes more or less affected by the committal of sins for which punishment is only looked for beyond the present life, when it is hoped an escape may be effected through “the vicarious atonement.” Present chastisements are overlooked, or attributed to other causes. People are often ill without knowing the cause, when, if they would turn their eyes inward and examine themselves searchingly, they would find that their physical discomforts arose from discords and inharmonies resulting from doing injustice to a neighbor, for wantonly letting slip a glorious opportunity to make some one happy.

Nations, as well as individuals, suffer from wrong-doing. Governments convulse and cripple their power, and shatter their *constitutions* by acts of injustice. It seems to me that nothing can be surer to end in discord, war, and bloodshed than despotism. Let any body of organized men prevent some other men from enjoying the privileges they arrogate to themselves, what more natural than for those oppressed men to conspire for the assassination, or, at least, overthrow of their oppressors? What can be a more dangerous element in one people than the existence among them of another people, who, for some reason not founded upon justice, are denounced as not so good, not so intelligent, not so capable in any sense, and for which they are denied privileges in the pursuit of happiness which their more powerful neighbors maintain for themselves? Can we reasonably hope to outlive conspiracy, war, and bloodshed, till we take our neighbor by the hand rather than by the throat? Considering the prevalence of conceit in this world, are any of you quite sure you are any better or more intelligent than the man you are holding your foot upon? and if so, is it not clearly your duty to take your foot off, give him a helping hand, and the widest opportunities and incentives for culture? Would it not be better to devote the money you are paying the soldier or policeman to keep him in vassalage, to his education and elevation? Some one has said: "A conscience is needed for the age, as for the individual—a power which shall reveal it to itself, and arouse and convict it." If, to-day, every ruler on our planet were making it the one great aim of his life to give equal religious, political, and social rights to all people; if oppressions were lifted from the hearts and shoulders of all men, if every individual would see his neighbor's rights as clearly as he discerns his own, the clash of arms on the battle-field between contending nationalities, the voice of intolerance between differing religionists, disputes in questions of law, the mutterings of men in petty strife, would all be swallowed up in one grand millennium of happiness and kindly feeling, which would go far toward promoting individual health and national greatness. This, you may say, is an ideal picture, and cannot be realized, but self-improvement will do it. If each one of us will bestow a portion of that labor and criticism upon ourselves which we put forth professedly to improve our neighbors, the object aimed at will in time be accomplished. Nations are made up of individuals, and, consequently, it is only necessary that every person know how much his own health and happiness depends upon those of his neighbor, and set himself about making himself more just, more truthful, more tolerant; to make society, nation, and government what each should be. We are apt, too, to say, our neighbor will not adopt the Golden Rule, and that, therefore, we will not. This is mainly the reason why a better condition of things is not attained. Every one is

waiting for another. Let every one who feels the first impulse toward self-reformation, inaugurate the work at once. If none of his neighbors do, he will find a full compensation in the mental and physical benefits that accrue to himself, and if he suffers from injustice from others, he certainly does not suffer from injustice to himself. One thousand such men scattered over the world in one generation, would become ten thousand in the next, and might, in a few generations, be counted by millions. Why hesitate because such a work cannot be accomplished in our life-time? Because of the disposition of men to wait for each other in undertaking the work of self-improvement, the world is now filled with dishonorable retaliation. I will relate an instance in point. Standing at the counter of a tradesman, while the latter was telling a customer what a smart trick he had perpetrated

FIG. 16.



GODDESS OF JUSTICE.

upon some one who had cheated him, I was witness to the narration of the dishonorable feat, during the telling of which his eyes sparkled with revengeful delight. He concluded with the triumphant interrogatory, "Didn't I serve him right?" This seemed as much directed to me as to my fellow-customer, and I felt morally bound to respond, when the following colloquy ensued:

"I don't think you did."

TRADESMAN—"Well, I do, for he is the biggest scoundrel in the city; and I always like to get the start of such men. He is always looking out for a smart game of grab."

"But of whom are dishonorable people to learn lessons of honesty, if every one who is defrauded by them, retaliates when opportunity offers?"

TRADESMAN.—"That is all very nice, but I am not the man to let a good chance slip to get even with the fellow who comes a big thing on me."

"Well, then, you are only confirming the usual opinion of dishonorable men, that 'all men are dishonest,' and your retaliation on him will lead him, when opportunity presents, to again retaliate on you, and so on indefinitely, till death ends the warfare. Perhaps if you had reminded him of the chance presented to 'get even with him,' and spurned it as something you could not stoop to, it would have aroused the sleeping sense of honor within him; but, if not, he could not justify his course of rascality with the reflection that he was as good as other men, for he would have, for once, at least, met, in a business way,

one man who was above both petty revenge and dishonesty. In my opinion, sir, you missed a golden opportunity to do a neighbor good."

The colloquy ended with a muttering response, which was not quite audible, but the tradesman, after all, was only practising a pretty well-established commercial code. Even when money is not an object, so dominant is the passion for revenge, business men often play financial tricks on their fellows, simply to "pay them off in their own coin" for some previous transaction of a similar kind, in which they were the victims. With this spirit of retaliation in the commercial world, where is fraud to end?

There is no one passion so dwarfing to man's moral growth, and, consequently, to his perfect physical development, as revenge. It whittles his soul right down to a pointed poisoned arrow, with which he is ever ready to pierce his offending neighbor. It plants in his eye an expression as fierce as the serpent's tongue; it shrinks the muscles of his face, and gives his lower jaw an unseemly protrusion; it makes him a stockholder in "hell upon earth," and his neighbors unwilling sharers in the dividends. A revengeful man has that within him which destroys capability of self-happiness, and all comfort to those who are compelled to come in contact with him.

Perhaps it is something that many have not thought of, but it will be found on experiment that nothing pays better, physically, as well as morally, than the cultivation of the moral nature. One gets his pay as he goes along. As remarked before, he is recompensed in a happier mind, and better physical health, and there are those coming after him whose happiness should be considered as important as his own, and the labor to promote which will make his soul larger, his nervous system more harmonious, his blood richer, and his muscles stronger, for is it not apparent in the light of this essay, that a peaceful, just, generous mind, and a clear conscience, strengthen the whole animal organism? In the language of Pope:

"Let Joy or Ease, let Affluence or Content,
And the gay Conscience of a life well spent,
Calm ev'ry thought, inspirit ev'ry grace,
Glow in thy heart, and smile upon thy face."

The Food We Eat.

Considering the fact that man by habit is omnivorous, and almost as much so as the pig, and that he eats about eight hundred pounds of food, exclusive of fluids, annually, it ought to surprise no one when I say that many derangements of the blood arise from the use of improper food. Look how directly the food is transformed into blood. It is taken into the mouth and masticated, into the stomach and digested, and then passes down into the lower stomach, where it meets the pancreatic fluids, and is sucked up into a duct, and carried directly into

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the blood at the angle formed by the great jugular vein on the left side of the neck, and the principal vein of the left arm. Then see how directly it goes to the manufacture of bone, muscle, nerve, etc. Oliver Wendell Holmes, in the *North American Review*, has presented this change very happily. "If," he says, "the reader of this paper lives another year, his self-conscious principle will have migrated from its present tenement to another, the raw materials even of which are not yet put together. A portion of that body of his which is to be, will ripen in the corn of his next harvest. Another portion of his future person he will purchase, or others will purchase for him, headed up in the form of certain barrels of potatoes. A third fraction is yet to be

Fig. 17.



"FLYING KNIFE AND FORK."

gathered in the Southern rice-field. The limbs with which he is then to walk will be clad with flesh borrowed from the tenants of many stalls and pastures, now unconscious of their doom. The very organ of speech, with which he is to talk so wisely, plead so eloquently, or speak so effectively, must first serve his humble brethren to bleat, to beHow, and for all the varied utterance of bristled or feathered barn-yard life. His bones themselves are, to a great extent, *in posse*, and not *in esse*. A bag of phosphate of lime which he has ordered from Professor Mapes for his grounds, contains a large part of that which is to be his skeleton, and more than all this, by far the greater part of his body is nothing after all but water, and the main substance of his scattered members is to be looked for in the reservoir, in the running streams, at the bottom of the well, in the clouds that float over his head, or diffused among them all."

The rapidity with which the food of to-day is incorporated into the body of to-morrow, should make us prudent in what we eat, if we would preserve our blood from impurity, and the atoms composing our bodies from disease. How prudent the human family is, may be seen by sitting at the tables of various peoples, civilized and barbarous. At home we are treated to all sorts of mixed dishes, seasoned with condiments, and saturated with the oleaginous juices of swine. Few of us stop to reflect that there may be as much antagonism in the stomach between the various kinds of flesh taken into it, as exists in the living world between the living bodies whose flesh we eat. A fashionable dinner comprises about half a dozen courses of different animal food ; in some cases oysters on the half shell, turtle soup, then fish of some kind, then roast beef or turkey, with side dishes of mutton or lamb, veal or pork, etc. It cannot, perhaps, be demonstrated, but is it not

reasonable to suppose, that each one of these meats possesses a latent magnetism, as individual in its character as when animated by life. If so, the stomachs of some people have, every day, to conciliate and make up a happy family of a great diversity of magnetic elements. To live fashionably is to live improperly.

FIG. 18.



A MARKET SUITED TO EVERY VARIETY OF TASTES.

Now let us step intrusively into the kitchens of our neighbors. John Chinaman feasts his stomach on cats, dogs, wharf-rats, sea-slugs, sharks, bats, and caterpillar soup. Australians, and many other people, eat snakes, kangaroo rats, mice, maggots, etc. The Japanese prefer green peaches, apricots, and plums, to ripe ones, as an offset, I suppose,

to our eating green cucumbers. A traveller among the Indians of the Rocky Mountains, or a guest of the people of Zanzibar, will smack his astonished lips over puppy stew, without knowing what it is made of. One who visits Africa, may have a plate of tender young monkey ; while the people of the Arctics treat their visitors to a diet of putrid seal's flesh, putrid whale's tail, reindeer's chyle, train-oil, whale's skin, and partially hatched eggs. The native of Surinam eats toads, and the Hottentot considers roasted caterpillars to be savory as sugared cream. Frogs are eaten by the French, by the Chinese, and by many people in both Europe and America. The French long ago took to eating snails, having found their flavor superior to that of frogs. One hundred thousand are daily supplied to Paris by Burgundy and Champagne alone. "In the interior of Mindanao, one of the islands of the Philippines," says a newspaper writer, "the Manzanays know nothing of the succulence of snails, but delight in fat grubs from the trunks of trees, eaten as we eat oysters, alive and shrinking." On the Maguey plant in Mexico, a large yellow worm thrives, which the native Indian eats, and calls the dish Maguey butter. A *Tribune* correspondent is responsible for the statement that the cultured but ill-fated Emperor Maximilian was induced to try it. In brief, among the many strange things used as food, not already mentioned, may be named : Elephant, hippopotamus, giraffe, zebra, antelope, wild ants, leopard, lion, alligator, crocodile, eggs of reptiles, lizard, wild-cat, panther, wolf, opossum, musk-rat, rat's brains, porcupine, bird's nest, locust, grasshopper, spider and nearly every insect; and the Chinamen are so given to domestic economy as to eat the chrysalis of the silk-worm after the cocoon has been wound off. In New York, the testicles of young animals are considered a dish for an epicure by many citizens. Charles Louis Napoleon Achille Murat, son of the great French general, who spent the closing years of his life in Florida, and who had tried all sorts of eating, declared as follows :

"Horse-flesh, good—dog, fox, and cat, only middling—skunk, tolerably good—hawk, first-rate—crow, second-rate—pigeon, jay-bird and blackbird, tolerable, and," he added, "though I have no prepossession, buzzard is not good."

Now, nearly all the foregoing animals, insects, etc., contain the true constituents of food, and many of them are not unwholesome. Some, indeed, which seem revolting to an educated taste, are better and purer for aliment than others which we regard as above criticism. To sustain life, we simply need food which possesses saccharine, oleaginous, albuminous, and gelatinous properties, combined with a proper admixture of salt, sulphur, iron, lime and phosphorus. But what we should do is to avoid food which, possessing all the necessary alimentary elements, is also tainted by disease.

One of the most common causes of blood impurities is the indiscriminate and reckless use of pork. It has been said that all things were created for some wise purpose. This is undoubtedly true, but hogs were never made to eat where a high state of civilization obtains.

FIG. 19.



THE USE OF SWINE.

"And when they were come out, they [the devils] went into the herd of swine : and, behold, the whole herd of swine ran violently down a steep place into the sea, and perished in the waters."—*St. Matthew*, viii. 32.

We read that Jesus of Nazareth used them to drown devils ; they can never be appropriated to a more beneficent use. As an article of diet, pork exerts a most pernicious influence on the blood, overloading it with carbonic acid gas, and filling it with scrofula. The hog is not a healthy animal. From its birth it is an inveterate gormandizer, and to satisfy its eternal cravings for food, every thing in field or gutter, however filthy, finds lodgement in its capacious stomach. It eats filth and wallows in its filth, and is itself but a living mass of filth. When, therefore, it is remembered that all our limbs and organs have been picked up from our plates—that our bodies are made up of the things we

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have eaten—what free pork-eater will felicitate himself with the reflection, that, according to physiological teachings, he is physically *part hog*. “We have been served up at the table many times over. Every individual is literally a mass of vivified viands; he is an epitome of innumerable meals; he has dined upon himself, supped upon himself, and in fact—paradoxical as it may appear—has again and again leaped down his own throat.”

From the earliest history of swine, they have been regarded as more subject to scrofula than any other animal. This disease, so peculiar to the hog, before it received a name, so far ante-dated the same disease in the human family, that when it did make its appearance in the latter, it was named after the Greek name of swine, as best expressing its character. There are various diseases peculiar to certain animals. Cats are subject to fits; dogs, more than other animals, to hydrophobia; horses to glanders and heaves; the cow to consumption and hollow-horn; sheep to the rot; fowls to the gapes, swelled head, and blindness; and scrofula is the prevailing disease among swine. Many of the diseases common to animals, and which render them unfit for food, are plain to be seen by the most ignorant butcher, and this is true also of some of the grosser diseases of swine. There are parasitic infections discoverable only by the careful observer with a microscope, which, if present in flesh, make it dangerous as well as undesirable food, but further, the quality or state of the tissues which is worthy of being called scrofulous, may exist without being discoverable “on sight” of the slaughtered carcass, or by microscopic study of bits taken from it.

Knowing, therefore, the constitution and habits of the porcine animal, it is questionable whether any slaughtered product therefrom can ever be considered wholesome and entirely free from the scrofulous quality, except, perhaps, it be bacon that has been thoroughly smoked and disinfected before being baked to a crisp.

It is apparent, however, that when scrofula may be communicated simply by habitual contact with a scrofulous person, the contact of scrofulous food with the mouth and stomach must inevitably inoculate the system of the imprudent eater. One fact regarding pork is well known to all physiologists. It is, with few exceptions, the most indigestible food that can be taken into the stomach, unless it be in the form of smoked bacon.

Again, pork is charged with being wormy. It killed a great many persons in Germany, and not a few in other countries, including our own. Many years ago a consul to Denmark wrote our Secretary of State all about it, and scientists, on both sides of the Atlantic, got out their microscopes, rubbed up their spectacles, and after examining the flesh of the arraigned porker, found he possessed imps of probably the same devils which were cast into his progenitors on the hill-side. The illustra-

tions in Figs. 20 and 21, show how these fellows appear under the microscope. They are called *Trichinæ*, and the disease they produce in man is denominated *Trichinosis*. The parasites are so minute that they can make their way to any part of the system, and a writer who has witnessed their effects thus describes them :

"This perforation of parts by millions of microscopic worms, is attended with symptoms more or less violent, depending upon their numbers, and the strength and health of the victim. While passing the coats of the bowels, violent purging often arises, simulating arsenical poisoning, and many people have been unjustly suspected of this crime, when persons eating food prepared for them have been thus alarmingly seized. As the worms make their way into the muscles, pains like those of rheumatism, cramp, weakness, or entire loss of power, resembling paralysis, ensue ; and when the numbers of trichinæ are large, wasting, exhaustion, and death follow. Those who escape with a few of these disagreeable tenants, suffer in a smaller degree from similar symptoms, but gradually recover, and a small portion of their muscles, removed and magnified, reveal the trichinæ arrived at their destination, and undergoing the various stages of calcareous encystment."

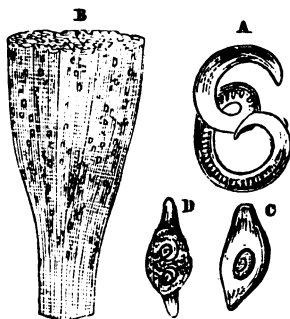
THE PORK PARASITE CAUSES INTERNATIONAL CONTROVERSY.

Since the lively interest awakened among scientists by the discovery of trichinæ as the cause of what seemed like epidemics of disease in Germany, pork has been a constant source of international dissension mixed with tariff issues. The German, the French, and many other European nations, for some time prohibited the importation of American pork, on the ostensible ground that it was largely infected with trichinæ, but, in fact, to protect home industries, till our own country found it necessary to set various commissions of experts at work to discover what basis there was for such charges. They always found that some percentage of American hogs were "guilty." Professor Dettmers, of the Agricultural Department, acknowledged finding the parasites in four per cent. of hogs slaughtered in Chicago, but the experts claim that this is a smaller percentage than is found in European examinations of the same kind. However, to allay foreign prejudices and make our hog products marketable abroad, Uncle Sam established a system of constant supervision of the wholesale slaughter and packing houses, for the purpose of thoroughly excluding all possible objection on the score of contaminated pork, but the difficulty is not yet settled.

Dr. Rudolph Artman, a German veterinarian, who was once employed in meat inspection in Germany, has been examining into the methods of the Bureau of Animal Industry of our country, and considers it a gigantic humbug—carried on at a cost of half a million dol-

lars per year—a decision quite in conformity with charges of the *New York World*. It appears that the examination, if not merely a matter of form, is far from thorough, and so far as the people of this country are concerned, there is no protection by keeping trichinous pork out of the market. Dr. Salmon, Chief of the Bureau, believes that it is unsafe to rely on microscopic examination of the meat, and that the only safety lies in thorough cooking. He claims that if all such food be

FIG. 20.



TRICHINÆ, CYSTS AND MEAT.

Fig. 20 shows the separated worm (A), the separated sacs or encysted worms (C D), and a piece of meat highly magnified (B) with many cysts scattered through it.

sufficiently cooked the microscopic examination is superfluous (except to pacify the foreign buyer); that the trichinous pork is just as good eating as any; and he further charges that in Germany, in spite of their careful inspection, far more people die of trichinosis than in this country, because the Germans have a fancy for eating raw pork, and because no microscopic examination can completely insure them against eating diseased pork.

On the other hand, Dr. Artman believes that the people of this country suffer far more than they know from infection with trichinæ; that the parasites do not always invade so quickly or numerous as to kill, and that in the many cases where they "go slow" and keep comparatively quiet, the victims become chronic sufferers from rheumatoid pains and other discomforts difficult to name or diagnose. He examined muscles taken from thirty dead human bodies, at Buffalo, and found trichinæ present in ten per cent. Yet he is not at all sure that ten per cent. of our population is thus affected. Dr. Artman also denies that the food value of trichinous pork is just as good as that which is free from infection, provided it is well cooked, on the ground that the trichinæ replace part of the muscle tissue with chalky deposits, and this is true, so far as it goes, but to the fastidious eater the knowledge of the presence of parasites, even if harmless because too well roasted to revive, would be apt to dull his appetite more than the fact that their chalky relicts diminish to some extent the food value. His relish for pork tenderloin will hardly be stimulated by the fact, now admitted by the Government Bureau, that all hogs which were found infected with trichinæ, withheld from export, amounting to two per cent. of the whole number inspected, have been thrown on the home market for consumption, instead of being boiled down in the rendering tank, as

represented by the inspectors in charge. If, like the farmer who keeps small potatoes for home use, we reserve all trichinous pork for home consumption, we shall not be surprised to learn some day that one-tenth of all pork-eaters are entertaining more or less of the trichinæ parasites in their muscles.

If, as Dr. Salmon seems to admit, parasitic pork may escape the vigilance of the hundreds of lady microscopists employed to detect them, this government bureau is a uselessly expensive matter of form ; but his claim that safety is assured by cooking is denied by German scientists who find that in a large piece of meat the heat at the centre, during cooking, is not sufficient to kill the trichinæ therein. There seems, therefore, to be no solution of this international sanitary and trade complication, but any person can settle the problem for himself by declining pork foods. Of course, even when cooking fails to kill the encysted worms it is possible that persons of remarkably good digestions and unlimited gastric juices may be able to digest them, but it is a risk they would hardly take knowingly. It is reported that during a period of five years, when the people of New York City and Philadelphia consumed nearly fifteen million hogs, among 350,072 deaths recorded there were only six, three in each city, from trichinosis ; but since it requires a microscopic post-mortem examination to determine it, very likely many more deaths were due to this cause than thus appears.

A HOG WOULD BECOME DISEASED BY EATING MAN.

It has been said that no animal was ever created which had an inherent proclivity to disease. This may be true ; but some animals from their earliest history have been diseased ; and none in the animal kingdom better illustrate this proposition than man and hog. And while I am firmly convinced that mankind are injured by eating hog, I am equally disposed to believe that the hog, if a healthy animal to-day, would in time become diseased by eating man. Both man and hog are intemperate eaters, and addicted to filthy habits. As for the latter, he is such a proverbial gormand, that no word in the English language so strongly portrays a voracious appetite as the term *hoggish*. Then his eating propensities are ever encouraged by the pork-raiser, who wishes to

FIG. 21.



ENCYSTED TRICHINÆ BETWEEN MUSCLE FIBRES.

In above figure the muscular fibres are shown pressed apart by a cysted trichinæ.

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make every carcass as heavy as possible. Many farmers and other pork-producers put their pigs in close pens, to prevent their exercising and running off their fat, and in these close, filthy quarters, the grunTERS are systematically stuffed till they can hardly open their eyes. What would become of a human being so treated? Could a man be so confined and fed, and not become a diseased and bloated carcass? It is equal to a fashion they have in Germany, of putting geese singly in coops so small that they cannot stand up or turn around, and there stuff them with a kind of meal mixture every day, until they become loaded with fat. Then they are considered in good condition to kill

FIG. 22.



THE UNHEALTHY PAIR.

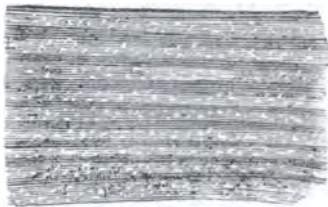
and eat. Can any creature in creation be treated in this way, or as swine are fattened, and not become diseased? What, then, may we expect of an animal which, from our earliest knowledge of him, has been scrofulous? It is related of Dr. Adam Clarke, that he had a strong aversion to pork, and that upon one occasion, when called on to say grace at dinner, where the principal dish was roast pig, he said: "O Lord! if Thou canst bless under the Gospel what Thou didst curse under the law, bless this pig."

HOG AND HOMINY IN OLD KENTUCK.

A good-natured farmer writes me that he and all his neighbors are pork-eaters, and that the people of "Old Kentuck" have always been fed on "hog and hominy," and yet are perfectly healthy and blessed with longevity. I reply, blessed with longevity, perhaps, but not entirely free from disease. I am often consulted by these very farmers, who open by saying, "I am not sick, Doctor, but I am plagued with salt-rheum." Another writes, "I am the picture of health, and my neighbors would laugh at me if they knew I was applying to a physician; but I am troubled with catarrh." Another has piles, another worms, another rheumatism, another predisposition to sore throat, and so on; but all

claim to be in the enjoyment of the best of health ! But there are unquestionably pork-eaters who have no apparent disease whatever. Although the scrofulous impurities of their diet find lodgement, they remain latent in their systems, and are even transmitted to their children, without manifesting themselves in the parent stock. Those especially who till the soil, toughened by exercise, strengthened by pure air, and relieved of much diseased matter by active perspiration, may carry with them to a gray old age a scrofulous impurity without suffering from its presence. But how is it with their boys who enter counting-rooms in large cities, or adopt professions of a sedentary character ? Have you never noticed how apt these scions of athletic sires are to break down before reaching the meridian of life ? Other causes than these inherited impurities may often contribute to this result ; but if impurities do exist to any extent, will they not be more likely to be active, and obtrusively present themselves in the form of disease, internal or external, in the confined atmosphere of the store or office, than on the broad acres of the parental homestead ? It may be a question of no little importance, how much the diseases of young men

FIG. 23.



INFECTED MUSCLE.

in villages and cities are derived from pork-eating progenitors, who pursued the healthful occupation of tilling the soil and feeding the pig.

My own opinion is that trichinæ are not liable to revive and become mischievously active in the human system after pork is thoroughly cooked—done through—unless there are impurities to resuscitate them and encourage their reproduction. The reason they affect the hog so extensively is because he is an unclean beast, although it is true that the same parasite has been found to some extent in other animals, such as the rabbit and cat.

If a man be scrofulous, or have other impure affections of the blood, the trichinæ are liable to be resuscitated and reproduced in the system, no matter how much they may be toasted, short of absolute scorching. Microbes only thrive in corruption, and when they get into a wound, confine their operations to the diseased tissue. So I confidently believe it is with the trichinæ ; they only have an affinity for such people as contain inflamed or corrupt blood, in which the health of the muscular fibre is involved, and, perhaps, such are the bad habits of the human family, and so prevalent the disease of the fluids, that any person, however healthy apparently, may be likely to be attacked with trichinosis if pork, or ham, containing the parasite, be eaten raw.

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Another worm or parasite that is common to both hog kind and mankind is a species of tapeworm, the *tania solium*. During its sojourn in swine flesh this parasite infests it in the form of little cysts that give the meat a mottled or "measly" appearance. Measly pork is tabooed wherever recognized, but much of it gets on the market nevertheless, and so into human stomachs, where, after the cysts or sacs are partly digested, the inclosed worms are let loose to set up business in a new style, and under another name as tapeworms. The tapeworm in man is more easily discovered, and less fatal by far than trichinosis, and it is less to be feared, because it can be routed out of its abode in the intestines, but few victims of tapeworm enjoy a sound state of mind after learning that they have taken in a lodger and boarder that pays no rent, and they willingly swallow many a horrid dose to rout him. It is fair to say that pork meat is not the only possible source of taking in a tapeworm. It may also be acquired from eating too rare beefs or mutton, since the flesh of these animals is sometimes "measled" or infested with the larval, encysted, (not dead but sleeping) forms of this and other species of tapeworms. Horse meat offers great advantages over other forms of flesh food in that it contains no such parasites, and no tuberculosis. If this fact were generally known, and the superior cleanness of horse meat appreciated, it ought to sell at a premium.

In closing what I have to say regarding pork, I would seriously advise all who will use the meat of this unclean beast, despite the objections to it herein offered, to cook every particle of it to a crisp. Bacon and ham, which are the most toothsome of all pork products, can be so treated without difficulty, and if pork sausages are to be eaten, they should remain in the hot frying-pan till they pop open and give evidence of having been cooked through and through.

PLENTY OF MORE WHOLESOME FOOD.

Mutton ought to be universally substituted for pork. It is less liable than the latter, or even beef, to augment uric acid in the circulation of those who are predisposed to diseases resulting from an excess of that acid. It is more easily digested, and may be regarded as a healthful meat. Besides, it can be produced at much less expense than pork among the farmers, and yields more nourishment. Sheep need no corn, and can be kept during the winter on hay, turnips, beets, etc. True, pigs will eat what nothing else will, and consume all the slops in the kitchen; but a great deal of corn, or other solid food is required to fatten them for the butcher. Besides, sheep will eat all that is fit for food from the kitchen slops, and their preparation for the slaughter-house is attended with trifling expense.

As a rule, the flesh of herbivorous is more wholesome than that of carnivorous or omnivorous animals. The use of animal food of every

kind has been pronounced injurious by many. That it is not necessary for the sustenance of man, in a normal state, I am fully convinced; equally satisfied am I that its moderate use is attended with no physical injury, but almost everywhere it is used to excess. Too much animal food inflames the system, and overloads the blood with the red corpuscle. In our climate, and in Southern latitudes, little or none should be used in summer, and in winter there is enough heat-producing food

FIG. 24.



SHEEP—WHOLE SOME TO THE EYE AND WHOLE SOME TO THE STOMACH.

of a vegetable character to impart sufficient warmth to those preferring vegetable diet. Still, beef, mutton, lamb, poultry, and even horse-flesh may be regarded as wholesome for food, if not eaten to excess. Professor Saint-Hilaire, of Paris, strongly urges the introduction of the latter as an aliment. He says that during the great French wars, the celebrated surgeon, Larrey, was accustomed to give horse-flesh to the wounded soldiers, and that he attributed their cure in many instances to this nourishment. The ancient Germans were in the habit of eating horse-flesh, and to this day, shops for the sale of this meat, under the superintendence of a veterinary college, exist by authority in Copen-

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hagen. It is also resorted to by the poor of Vienna, while in Hamburg it commands a high price. The horse is considered a great delicacy in some of the southern portions of South America, where it is introduced at the festive board as a luxury, equal to a sirloin of beef. There can be no doubt of its utility and cheapness on the battle-ground, where the majestic steed is hourly falling before the destructive cannon-ball. Those who turn up their noses at the idea of eating horse-flesh, are requested to lead a horse from the stable, and a pig from the gutter, and ask themselves which is the more respectable looking candidate for the carver. [Since the foregoing was written, horse-meat has been adopted as an article of food by many in all civilized countries and much of it is being used in the United States.]

If I may be allowed a brief paragraph, to deviate from the legitimate purpose of this chapter, I will remark that the excessive use of animal food is a great *social evil*. It is a proverbial fact, that mankind are too much given to the brute diversion of fighting. Our halls of legislation are disgraced with personal encounters between gentlemen who are *supposed* to be far elevated above the brute creation, by their distinguished intellectual endowments. Now, we have as good authority as Professor Liebig, that meat makes men more pugnacious. He says : "It is certain that three men, one of whom has had a full meal of beef and bread, the second, cheese, or salt fish, and the third, potatoes, regard a difficulty, which presents itself, from entirely different points of view. The effect of the different articles of food on the brain and nervous system, is different, according to certain constituents, peculiar to each of these forms of food. A bear kept in the anatomical department of this university, exhibited a very gentle character so long as he was fed exclusively on bread. A few days' feeding with flesh rendered him savage, prone to bite, and even dangerous to his keeper. Swine grow irascible when fed on flesh, so much so that they will attack man. The carnivorous are in general stronger, bolder, and more pugnacious than the herbivorous animals on which they prey. In like manner, those nations which live on vegetable food, differ in disposition from those which live chiefly on flesh." Forbearance is a great virtue, and should be cultivated by every enlightened man. Had human beings been intended for fighting animals, their finger-ends would have been decorated with huge unbending nails, and their jaws distended with savage tusks, like the boar. The excessive use of flesh is not promotive of amiability, but rather leads man to forget his present duty, and his higher destiny. It excites those emotional faculties which are prone to dethrone reason.

An Edinburgh physician, Dr. Haag, in *The Hospital* undertakes to prove that the excessive use of meat leads to suicide. He attributes the disposition on the part of many unhappy people to

hasten their exit from the world to the presence of an excess of uric acid in the system, and this excess he believes to be due to the use of too much animal food. He does not quite prove his doctrine with evidence which would be accepted as final by a scientist, but when we admit that a meat diet renders the human family more pugnacious, it is not impossible that a man well fed on the flesh of other animals might exhibit his pugnacity in inflicting fatal wounds upon his own person as well as upon his neighbor's.

A noted Hindoo scholar, in an address before the Vegetarian Society of New York, said that his people in India believe "a diet of meat makes man restless and less self-controlled, like all carnivorous animals. He expresses the belief that the eating of flesh and the drinking of wine go hand in hand, and that a diet of meat conduces to selfishness and accustoms one to the butchery of innocent beings."

Much has been written, *pro* and *con*, as to the necessity of resorting to the animal kingdom for sustenance. It seems to me the vegetarians have the best of the argument. Vegetables possess all the necessary elements of food, and by combination or eaten in variety, impart more nutrition than animal diet. According to the investigations of Liebig, and other celebrated chemists, peas, beans, and lentils contain more of the blood-forming principle to the pound, than meat; wheat meal contains about as much, and oatmeal, barley meal, stale bread, and maize meal, about half as much; and when you seek the heat-forming principle, potatoes contain more than meat, while bread, peas, lentils, barley meal, beans, sago, maize, oatmeal and rice, yield double and treble the supply to the pound that animal food does. Nearly all vegetables provided for the table contain more solid matter to the pound than meat possesses.

FACTS REGARDING VEGETABLE DIET.

Facts sustain the vegetarian. A large portion of the people of Ireland, in their native home, hardly taste meat. They subsist upon potatoes, oatmeal, and cabbage. Many of the Asiatics mainly subsist on rice and vegetable oils. The Lazzaroni of Naples, with all their uncleanness, idleness, and vice, maintain a good physical appearance on a diet of bread and potatoes. The Turks live mostly on vegetables, fruits, and nuts. A traveller remarks: "Chops, substantial soups, joints, anything on which a Westerner could support nature, are never seen in a Turkish bazaar." We have people living in various parts of the United States who are practical vegetarians, and eschew animal food of every description, excepting it may be eggs, milk, and butter, and some of these people do not use the latter. I once met a hard-meated, healthy young Jew, who subsisted on Graham bread, fruits, and nuts; and to carry out his dietetic rules he hired a room and

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boarded himself, which he could easily do without cook or housekeeper. D. U. Martin, the vegetable wherryman, gymnast, and phrenologist, tested his strength and endurance by subjecting himself to all sorts of hardships and exposures while pursuing strictly a vegetable diet. He subsequently adopted an exclusively fruit diet, mainly apples, with what results I am unable to state. In June, 1899, Gus Egloff, a

FIG. 25.



THE VEGETARIAN BICYCLIST.

German-American cyclist of New York, only nineteen years old, rode 1,000 miles on Long Island roads in four and a half days, with only six hours sleep, while subsisting on a diet of milk, crackers, ice-cream and coffee.

Many years ago Dr. Bourne, a vegetarian of San Francisco, a gentleman then sixty-six years of age, walked a distance of nearly seven hundred miles, eating nothing on the way but "crackers baked from unbolted wheat flour, with a little fruit by way of dessert, and drank only cold water." At this stage of his journey, for he was going farther in proving the value of a vegetable diet, "he walked with an easy stride which," said a newspaper reporter, "would

bother half our young men to keep step with."

Charles W. Miller, of Chicago, a vegetarian, won the first prize at a six day's bicycle race in New York in 1897, in 1898, and again in 1899. "The score at the end of the race on December 10, 1898, was," says *Food, Home, and Garden*, "2,007 miles, while Waller, his closest competitor, scored 1,985 miles." In answer to an inquirer, he said: "My diet consisted of only oatmeal, boiled rice-pudding, custard, kumyss, and grapes; on the last day, milk, coffee, apples, and oranges. No meat, whatever, at any time. I never use meat in my races. No butter and no cheese were used."

"Mr. Miller," says the same paper, "was evidently not seriously fatigued, as on the last day of the contest he took one hour off the track, during which time he was married to Miss Hanson, also of Chicago, and then resumed the contest on the wheel, which continued until 10 P.M. At eleven o'clock Saturday morning, it was announced, amid much applause, that Miller had beaten his own record of a year ago by three miles, and after this he settled down to a methodi-

cal gait, and in two hours the substantial distance of eighteen miles assured him of victory over all his nearest competitors. We understand Mr. Miller's earnings were \$4,000 and a good Chicago wife! Thousands of spectators witnessed the contest, and the management reaped a handsome profit."

In Berlin, Germany, in June, of 1898, there was a notable walking race in which Karl Mann, a vegetarian, won a 70 (English) mile walking race in fourteen hours and eleven minutes. According to a magazine, entitled *Food, Home, and Garden*, there were 25 entries, of whom 17 were flesh eaters and eight were strict vegetarians, Karl Mann being one of the latter. "The weather was unfavorable, with rain in the latter part of the afternoon." With the exception of five or six miles of macadamized highway, "the road lay along poorly made country roads without foot-paths." The result, as given by the magazine already named, was as follows: "1—Karl Mann, vegetarian, 14 hours, 11 minutes; 2—Emil Makowski, vegetarian, 14 hours, 82 minutes; 3—Fritz Badenstein, vegetarian, 15 hours,

FIG. 26.



THE VEGETARIAN PEDESTRIAN.

34 minutes; 4—Wilhelm Damm, vegetarian, 15 hours, 59 minutes; 5—Paul Schirrmeister, vegetarian, 17 hours, 6 minutes; 6—Herman Zerndt, vegetarian, 17 hours; 7—Friedr. Zahrt, *flesh eater*, 17 hours, 82 minutes. The six vegetarians all came in as certified by the judges, in excellent form. The only arriving flesh eater who finished more than half an hour after the two last vegetarians (notwithstanding their having made five miles more than he), after calling for brandy, put up in the village for the night!" Professor Goldwin Smith, of Cornell University, writing in the *Toronto Weekly Sun*, respecting this trial of pedestrian endurance, says: "In a 70-mile walking race in Germany the vegetarians have shown a remarkable superiority in endurance over the eaters of meat. There is nothing new in this. Extraordinary journeys are made by the Hindoo palanquin-bearer, whose only food is rice. There is probably a gradual tendency on the whole, to vegetarian diet. It does not appear that animal food is absolutely essential to any function of the human body or brain. No man

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did a better day's bodily work than the British farm laborer when he had no meat but a taste of bacon. No man ever did a greater amount of brain work than a monastic saint, who was forbidden meat—by the rules of his order. No man ever produced higher fruits of his imagination than Shelley, who was a devout vegetarian. A much greater amount of vegetable than of animal food can be produced on a given area. The inclination of taste as human nature grows more refined, points the same way. Homeric heroes ate masses of meat apparently without vegetables; and to the bard of that day the picture of the shambles is not less congenial than that of the harvest or the vintage. To us the details of the shambles are abhorrent. We require vegetables with our meat, while there is a tendency to disguise the meat itself by elaborate cookery. On the whole, it seems probable that progressive vegetarianism is the rule, though there will be no sudden leap, nor will the vegetarian think it his duty to enforce this habit on us by law."

It sometimes seems as if we only use meats as vehicles for conveying salt, sauces, and condiments to the stomach. People think they love the flavor of animal food itself. Just try it without salt, pepper, mustard, butter, or other seasoning, and see. Advocates of animal diet generally refer to the teeth, and some to the anatomical formation of the stomach, for evidences that our Creator intended that we should eat meat; but the teeth and stomach of the orang-outang resemble those of man, and yet he does not belong to the carnivorous or omnivorous species. Du Chaillu says, that notwithstanding his large canine teeth, the gorilla of Africa is a strict vegetarian. According to Cuvier, "man's teeth are frugivorous—the cow's herbivorous—the lion's, carnivorous—and the hog's, omnivorous," so that both sides claim that the indications of the dental organs favor their distinctive views of diet. We have the testimony of the great naturalist Linnæus, that "man's organization, when compared with that of other animals, shows that fruits and esculent vegetables constitute his staple food." In eating the flesh of animals, as I look at it, we get vegetables second-hand, and contaminated more or less by the diseases with which they are affected. There is, however, in animal food, a stimulating property which vegetables do not possess. Having heard of vegetarians being made slightly intoxicated by beefsteak, I once induced a vegetarian friend to try the experiment on himself, and he assured me it produced in his brain a sensation similar to that induced by a slight potation of alcoholic liquor. It is said that Irishmen who live exclusively on vegetables at home, on enlisting in the British army are sometimes attacked with what is called "meat fever," in consequence of their new diet being so much more stimulating than that to which they had been accustomed.

There is a supposed necessity, and possibly a real necessity in some cases, for the use, to some extent, of animal food. This undoubtedly

results from the habits of our ancestry. The child of an inebriate father often inherits his appetite, and cannot resist the temptation to drink intemperately of intoxicating beverages, and it may be easily supposed that the child of meat-eating parents may at least imagine he cannot live without meat. When, during a long line of ancestry, animal food has been the principal article of diet, the necessity may be actual instead of imaginary. He is like a patient who told me disease was his normal condition, and that medicine was his natural food! Opium eating sometimes becomes a necessity by the perversion of the system by narcotism. Whatever may have been the original practice of mankind in the infancy of its development, I am confident the time will come when a more humanely developed and civilized humanity will look back upon us of this century as a race of cannibals. No man or woman to-day, of noble sentiment and sympathetic nature, unless the *habitus* of the market, and thus hardened by familiarity with such

sights, can pass the stall of the butcher with its display of trunkless heads of calves, pigs and cattle, and the bleeding and partly flayed carcasses of lambs and sheep, or look upon the white, but blood-stained apron of the meat-man, holding his monstrous knife, without a shudder, and a feeling of self-condemnation that he and she are accessory to this wholesale slaughter of innocent animals. "The dog delights to bark and bite;" it is the instinct of the cat to sneakingly assail and devour animals too weak to resist her prowess; it is in the nature of the huge boa-constrictor to swallow pigeons, rabbits and other small game by the bushel; it is the habit of the large fish to live upon the smaller ones, etc. But when we ascend from these lower species of the animal kingdom to the "noblest work of the Creator," may we not reasonably look for an end to this mutual carnage for the wherewithal to keep the vital machinery in action?

What excuse for man, who can shake from the tree above his head the juicy fruit which is ready to fall ripe into his hand; who can pluck from the vine clusters of delicious grapes containing all the elements of food, prepared only as Old Dame Nature can prepare them; who can plough up the rich sod, and produce by the planting succulent vegetables and fields of golden grain, and beneath the surface of the grim soil,

FIG. 27.



VEGETABLE FOOD.

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esculent roots capable of imparting warmth and nourishment to the body ; who can find in the rich meats of abundant nuts, and other oily products of plants and trees, all the oleaginous properties which animal fat supplies ; what excuse, I ask, for man, with all these luxuries at hand, loaded with the necessary alimentary constituents, to imitate the murderous instincts of the lower animals, and cannibally live upon animals less powerful than himself ! There is one excuse, and only one, that can be presented for a man of this century, namely : a meat-eating ancestry, and in some cases an ancestry of meat gormands. As before remarked, with some persons it seems to be an inherited necessity. But I have faith that man will some time outgrow this brutal appetite—this cruel physical necessity. The dawn of the “good time coming” cannot light up human hands and arms red with the blood of slaughtered animals, or overtake the athletic man picking the bones of tiny birds ! The ingenious Yankee has already invented a substitute for leather, and we have quite enough substitutes for ivory and bone. There are millions of men and women to-day who would give up a meat diet if they were compelled to slay the animals they eat. Stop for a moment and read

HOW THE KILLING IS DONE.

The following is copied from a daily paper—it is headed : “How Cattle are Slaughtered—Sunday Scenes at the Abattoir.” The writer then proceeds : “On the arrival of cattle, they are transferred from the cars to yards, where usually they remain until sold or slaughtered. Before they are killed, eight or ten are driven up an inclined plane into the abattoir, where they are confined in pens about ten feet square. A row of these pens extends across the building, directly back of the dressing racks. When an animal is needed, he is either drawn up with a rope attached to his hind leg, or he is speared. If the cattle are wild, the executioner mounts the stall, and takes his stand immediately over his victim. His spear is a rod of iron, six feet long, an inch in diameter, sharpened at the end like an oyster-knife. The ‘killing spot’ is just behind the horns, on the neck, which the spearsman frequently does not hit. To see a person throwing one of these spears into a pen of cattle is sickening. Often several bullocks are pierced in the forehead or eyes, and their faces are streaming with blood long before the death of a single one ! The wounded, after waiting from ten minutes to an hour for their turn, are again attacked, and killed one by one, the survivors receiving fresh wounds on every attack ! A Western expert,” continues this writer, “styles this treatment the devilish torture of a bungling butcher.” (If it only were, I should say Amen ; but it seems to be the devilish torture of innocent animals.) “Cattle are not the only sufferers, but the swine are also pierced, and often plunged into scalding water before they are dead ! The butchers say that the spear